Railway Age

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EDITORIAL

Railway Age

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Rail Output Continues Decline in 1922

The statistics of rail production for 1922 and preceding years given elsewhere in this issue are of more than usual interest because of the trends which they indicate. Rail production in gross tons was lower in 1921 than in any of the preceding 12 years with one exception, 1914, and this decline continued in 1922, although the decrease was only a small one. This decline during the last two years may doubtlessly be attributed, at least in part, to the fact that there are many roads which are securing a considerably longer life from the heavier rail which they are now using. In this connection, it is decidedly interesting to note that the production of rail sections between 85 lb. and 100 lb. has had a very steady decline while the production of sections 100 lb. and heavier has shown a material increase, amounting in fact to about a 60 per cent increase in the last eight years. Further than that, the production of the 100 lb. and over sections was greater in 1922 than that of the 85 lb. to 100 lb. for the first time, being 902,900 tons for the former and 725,604 tons for the latter. During the last 10 years Bessemer has shown as marked a decline as open hearth has an increase, the one very nearly balancing the other, until in 1922 the production of the former had become practically nil. Only 22,317 tons were produced that year, or about 1 per cent of the total production. It is fairly evident that the rail of tomorrow for all but the light traffic roads will be the so-called heavy sections with their longer life, and this in conjunction with the small amount of new line construction will doubtless have a material effect on rail production that must be taken into account in the future.

Putting Public Questions in Plain Language

A crisis is a time for plain speaking. Elisha Lee, vice-president of the Pennsylvania Railroad, in his speech at Philadelphia on April 24, reported in this issue of the *Railway Age*, said in substance that a congressman who, at this time, from certain well-defined selfish motives, refuses the railroads a reasonable income, is a traitor to his country; and presented a very reasonable argument in support of that accusation. In another address, in the same city on April 27, he said, what every well-informed citizen knows, that the law intends to give the railroads 5¾ per cent; that thus far, this intention has not been carried out; and that some congressmen are trying to reduce that figure. It is good to continue plain speaking. Is it possible to reduce freight rates for the farmer without diminishing the carriers' net income? Answer this or accept the railroads' declaration that it is not possible. Should the people, *in their own interest*, keep down the railroads' income for the purpose of punishing them for the alleged crime or offense of borrowing money at too high rates of interest? The answer to that question also needs to be published and to be reiterated. Does any congressman believe that the railroads' present proposals are other than fair, honest and above board? If so, where, and when and in what respect? Mr. Lee is very definite in his promises of efficient service. Any doubter is bound to be equally definite. Every reasonable business man, aiming to earn 5¾ per cent, is in duty bound to strive for an income considerably higher than that, in order to provide some reserve against dull years; should a railroad manager do less than this? If he does do less, he is neglectful. Does any member of Congress believe otherwise? On what grounds? Does Congress believe that the railroads are not to be trusted to rightly conserve a reserve fund? If so, the reasons should be very clearly stated.

Bright Colors to Attract Passengers

The Interborough Rapid Transit Company, which operates subways and elevated railway lines in New York City, is engaged in an intensive campaign to popularize its elevated lines which of recent years have been losing traffic to the subways to such an extent that the subways are greatly overcrowded. The Interborough's elevated lines antedate the subways by many years. They are not as well equipped with modern rolling stock as the subways, and the operation of express trains during the rush periods on their recently provided third tracks has not enabled them to provide an all-day service either as fast or as frequent as that available on the subways. The company has now inaugurated a policy, however, of providing maximum utilization of its elevated lines to bring them into active competition with its subways. The first step has been to add 428 trains on the elevated, thereby increasing the frequency of the service and permitting the operation of express trains throughout the day, instead of only during the rush periods. As an additional attraction to passengers the elevated cars are to be brightened up with what the company terms a "golden rod orange" paint. A number of the orange-colored trains are already in operation and their appearance is so much of an improvement over that of any other rapid transit trains in New York that it does not require a surplus of optimism to predict their success as competitors with trains of a somber-hued, bedraggled appearance. Steam railroad men should be interested in following the Interborough's experiment. If brightly-painted, neat equipment is successful in competition in the rapid transit field might it not deserve a more general trial by the steam railroads?

The Free Rider Is Always Envied

Somebody imagines that Senator Couzens and others will appeal to Congress to stop the general railroad practice of giving free rides to employees; and to show how unreasonable it is to be so generous with passes, it is pointed out that even Mr. Ford, the most liberal employer in the world, has never thought of giving to each employee a Ford car. It can hardly be that any considerable number of congressmen will take this proposal seriously; but it is elaborated to the extent of half a column, in a large and dignified daily paper, and it is perhaps worth a paragraph to remind these original minds that the supposed problem was settled about 50 to 75 years ago. The classical version of the story relates to a new freight brakeman, lately from a farm, who, on the

first Saturday night, desired a pass to his old home. "What!" said the superintendent, "Would you expect a farmer, who employed you, to hitch up a horse and buggy to carry you home every Saturday night?" "No, of course not," said the brakeman; "but I should call him darned mean if, having his team all hitched up, and going that way, he refused to give me a seat." And he got the pass. These new and very fresh friends of the public should find out the number of extra seats the railroads do actually move in passenger trains for dead-head passengers. The cost is literally too small to be mentioned in comparison with the amount of good-will engendered by a liberal policy. It is said that Horace Greeley, founder of the New York Tribune, at one time paid money for his own copy of each issue of the Tribune. That is the extreme view. It may be noted that there are some very strict constructionists in the world of railroad officers, and that the absence of any proposal of this kind in the American Railway Association is good evidence that present sentiment in that field is substantially unanimous. In speaking of good will, it should be borne in mind that, to engender ill will, a railroad need not do anything mean or stingy; if it were simply to insist on its minimum cold rights it would neutralize or destroy much good will; for railroad employees are not very different from other people in this respect.

How Modern Machinery Does the Trick

If a machine, twenty years or more old, still performs the function for which it was designed, the advisability of scrapping this machine in favor of a 1923 model is not always easy to demonstrate. In most machines, however, improvements during the past five years alone have increased their productive capacity to such an extent that earlier types can positively be relegated to the scrap heap wherever there is work enough to keep the new machines busy. Among railroad shop tools, the planer will serve admirably to illustrate this point. To the uninformed, a planer is a planer, and the modern machine does not differ greatly from its forbears of twenty years or more ago. The planer operator knows differently and the machine shop foreman who must get work done knows differently. Recent improvements in planer design have been almost revolutionary. In the first place, the new planer is built powerful and rigid enough to push high-speed cutting tools to the limit. On this account, the new planer can produce from four to possibly sixteen times as much as the old type machine, depending on how long ago the latter was designed. The new machine can be provided with four heads if necessary and will plane three sides of a locomotive frame at the same time. In two settings, the entire frame can be planed as against four settings formerly required. Pendulum type push button control enables the driving motor and planer table to be started and stopped instantly from any position ordinarily occupied by the operator. Many steps are saved. A wide range of cutting and return speeds, quickly and easily available, give the operator an incentive to change to the correct speed for each job, thereby saving planing time. Rail heads traversed rapidly by power save time and operator's strength. Rugged planer construction throughout practically eliminates vibration and spring and, together with herringbone gear drive, assures a smooth job without chatter marks. The accuracy of the modern planer prevents lost time in the erecting shop due to inaccurate parts which will not properly fit together. Forced lubrication to the vees insures a film of oil at all times between the table and bed and provides long planer life. These are some of the reasons why the modern planer, typical of other standard shop tools, can show a marked economy over machines built before the days of high-speed steel and before so much attention in machine design was given to power, accuracy and convenience.

When Regulation Restricts Initiative

The restrictive effect of regulation on the exercise of initiative in railway management is shown in a striking manner by the delay imposed on the Illinois Central in reference to its plan to build a new low grade line between Edgewood, Ill., and Fulton, Ky. Faced with the necessity of providing increased capacity on its New Orleans-Chicago line and also on its Louisville division, this road plans to build a line 170 miles long which will give the desired relief at a cost of $17,000,000, as compared with an outlay of $24,000,000 to secure the same capacity along existing lines. The new route will also shorten the distance 22 miles and reduce the maximum grade from 1.2 per cent to 0.3 per cent. Plans for this improvement were announced late last year and steps were taken to commence construction early this spring. However, the cities along the existing line raised such vigorous protests against the diversion of through freight traffic to the new route that the Interstate Commerce Commission withheld its approval of the road's petition for authority to build the line until it could hear the objections. These were presented at a hearing at Cairo, Ill., in April and the commission now has the matter under consideration with a decision expected about July 1. While it is not anticipated that the commission will submerge the interests of the country as a whole to those of a few local communities and refuse to permit the railway to proceed with its plans to reduce operating costs, the result has been to delay the inauguration of this work and to cause the road to lose the best part of a working season. This delay will also add measurably to the cost of the work because of the higher prices and decreased efficiency of labor which are developing. These increased costs must of necessity be reflected in the cost of the property on which an adequate net return must be earned.

The Virginian Electrification

THE VIRGINIAN RAILWAY on May 1 awarded a contract for the electrification of its line between Roanoke, Va., and Mullens, W. Va., to the Westinghouse Electric & Manufacturing Company. The distance between these two points is 134 miles and the track mileage to be electrified is 213. The total cost of the work will be $15,000,000. The district is the mountain grade section of the Virginian which includes the two per cent grade opposed to eastbound traffic to the summit at Clark's Gap. The Virginian is noted for its unusually heavy train loading and for the unusually heavy power which has been used to secure this result. The road's traffic, which consists almost entirely of bituminous coal moving from the New River and Pocahontas districts to tide-water at Hampton Roads, has been expanding rapidly and the present contract,—incidentally, the largest single contract for electrification ever awarded,—is the latest step in the program which the railroad has adopted to take care of its increasing business.

Predictions relative to the electrification of steam railroads ranging from conservative to the most extravagant estimates have been common for the last 20 years. The actual developments in electrification during the past five years have failed to meet even the most conservative estimates made prior to the beginning of the World War.

In the period shortly before and after 1916 many studies of electrification projects were made which indicated the economic feasibility of a majority of these projects. Immediately after this period, however, economic and industrial conditions brought about largely by the World War compelled the postponement of action, pending the return of railroad conditions to a normal state. Among these were at

least half a dozen major electrification programs which appeared to be most promising in their engineering and economic aspects, all of which have been held in abeyance since the early part of the World War, and many or all of which promise to become active or to be undertaken whenever railroad and industrial conditions warrant.

There are ample indications at the present time that railroad and industrial conditions have reached such a state that these projects may and very probably will be re-opened and that there will result an activity in electrification which will exceed anything which has been predicted prior to this time.

Among these indications may be named first the general great improvement in the railroad situation and second the activities of a number of roads, i.e.: The recent extension of the Norfolk & Western electrification and the purchase of additional new locomotives, the first to be purchased since the inauguration of electrical operation on this railroad; a recent addition of a considerable amount of electric motive power on the New Haven; the purchase of additional electric locomotives by the Pennsylvania as well as the active study of a considerable electrification program of main line operation by the Pennsylvania; the definite decision of the Illinois Central to electrify its terminal service in Chicago; the decision of Henry Ford to electrify the Detroit, Toledo & Ironton and the contract awarded for the electrification of the Virginian, the largest undertaking of its kind in America.

The evidence of confidence in the future of American railways afforded by this revival of activity in electrification indicates that the period of postponement of many of the undertakings which have been held in abeyance has come to an end and that there may be expected in the immediate future a revival of electrification which has no precedent.

The Efficiency of the Railroads

ONE swallow does not make a summer, and neither does evidence that there has not been a satisfactory increase in efficiency in one branch of railway operation prove general inefficiency in the operation of the railroads.

In its issue for February 11, 1921, the *Railway Age* published an article entitled "Are Modern Locomotives Efficiently Used?" This article was intended to call attention to one important fact regarding the development and operation of the railroads. This was that during a period of years the total number of tons of freight moved one mile had not increased as rapidly as the aggregate tractive power of locomotives. It was shown in this article that the average tons of freight hauled in each train had increased more than the average tractive power of freight locomotives. It was shown that the failure of the total freight service rendered to increase as much in proportion as the total tractive power of locomotives was due to the fact that for some years the average number of miles each locomotive had been run annually had declined.

Our purpose in publishing this article was to emphasize the need for improvements in locomotive terminal facilities and operating methods that would make it possible to run each locomotive more miles annually, and thereby secure increased service in proportion to the increased tractive power. In the same issue in which this article appeared there was published an editorial in which it was expressly stated that the facts presented "are in no sense an indictment of the efficiency with which the existing transportation plants have been operated." Indeed, as was said in this editorial, "the facts presented show a marked improvement in operating efficiency."

United States Senator Couzens of Michigan, in a letter to Julius Kruttschnitt, which we published in our issue of April 21, quoted from the article referred to in support of his criticisms of the railways for alleged inefficient operation, but disregarded what we had said in our editorial regarding the true significance of the facts presented in the article. In addition, he quoted statistics of operating results in 1921 and 1922 in an effort to show that there was a decline in operating efficiency in those years, because the amount of freight service rendered with each locomotive, freight car and train declined. Senator Couzens' statistics for 1921 and 1922 do not prove anything with respect to railway efficiency. These were years in which the freight business available was much smaller than in 1920, and, of course, the amount of freight service rendered with each unit of equipment declined. Furthermore, neither Senator Couzens nor anybody else, by correct use of statistics, can show that there has been at any time a decline in the efficiency of operation of our railways under private management.

The true test of whether a railway or a system of railways increases its efficiency of operation, is not whether the efficiency with which any particular part of its plant is used increases, but whether the efficiency with which its entire plant is used increases. Now, the facts demonstrate beyond question that until government operation was adopted in 1918 the general efficiency of operation of our railways was constantly and rapidly increasing. The facts also prove, that the effects of government operation have been largely removed and that the general efficiency of operation has been restored to about where it was in 1917.

TON MILES OF FREIGHT SERVICE RENDERED

Year	Per mile of line	Per employee	Per mile of track	Per freight car	Per ton freight car capacity	Per freight locomotive	Per 1,000 pounds tractive effort	Per $1,000 of capital investment
1907....	1,040,210	141,501	721,399	118,799	3,527	7,375,573	240,000	18,160
1917....	1,695,187	227,636	1,069,929	171,365	4,132	10,701,709	272,000	22,210
Per Cent Inc.	63	61	48	44	17	45	13	22
1918....	1,738,742	220,595	1,088,449	174,312	4,189	10,576,024	260,000	22,250
1919....	1,554,396	190,912	970,351	154,296	3,680	9,360,046	226,000	19,660
1920....	1,744,246	202,837	1,087,257	166,518	4,172	10,668,383	253,000	19,061
*6 Mos. to March 31	883,000	114,400	542,000	83,700	1,980	5,915,000	118,000	10,295

*Partly estimated.

The accompanying table shows that in the ten years ending with 1917 the number of ton miles of freight handled by the railways per mile of line increased 63 per cent and that per mile of track it increased 48 per cent. There is no better test of the efficiency with which a manufacturing plant or a railroad is managed than the increase in output secured by it per employee. In these ten years the number of tons of freight carried one mile by the railways per employee increased 61 per cent. Ton miles per freight car increased 44 per cent, and per ton of freight car capacity 17 per cent. Ton miles per freight locomotive increased 45 per cent. For some years following 1903 the total tractive power of locomotives increased more than the total freight service rendered, but this tendency in the wrong direction was being corrected, and in 1917 the member of tons of freight moved one mile per 1,000 lb. of tractive power was the greatest in history, excepting in one year, and was 13 per cent greater than in 1907. The increase in freight service rendered per $1,000 of capital investment during these ten years was 22 per cent.

In 1918 government operation of railways was adopted. Then for the first time in many years a decline in the amount of freight business handled per employe occurred, this be-

ing entirely due to an abnormal increase in the number of employees. There was also a decline in the amount of freight service rendered with each freight locomotive and per 1,000 lb. of tractive power. In other respects the efficiency with which the physical facilities were used showed an increase, although it will be recalled there was an increase of 40 per cent in total operating expenses.

There was a decline of freight business in 1919 and, therefore, the statistics regarding the utilization of the physical facilities in that year have no special significance. One fact of great significance, however, is that in spite of the decline in freight business in 1919, there was a further increase in the number of employees. The combination of these two factors caused a further substantial decline in the amount of freight business handled per employee.

The freight business handled by the railways in 1920 was the largest in history. The demoralization of the employees resulting from the war and government control, the "outlaw" switchmen's strike in the spring of that year and other causes prevented the average efficiency of operation during the year being raised to as high a point as was attained in 1917. In 1921 and most of 1922 the great slump in business, the coal strike, and the shop employee's strike made it impossible to use facilities with maximum efficiency.

For over seven months now, however, the railways have been handling a larger business than in any corresponding previous period. Some of them have been hampered by the effects of the shop employees strike; and winter weather always interferes with securing the maximum utilization of facilities. The statistics for the six months ending March 31, which are given in the accompanying table, demonstrate, however, that in most respects, in spite of adverse conditions, the efficiency of operation has been restored. Making allowance for the fact that these statistics are for a half year, it will be seen that the railways in this period handled relatively more freight business per mile of line, per employee and per freight locomotive than in any year in their history. In other respects the best records of previous years were approached, excepting that the amount of freight service rendered in proportion to the tractive power of locomotives does not make a satisfactory showing.

Senator Couzens in his letter to Mr. Kruttschnitt charged the railways with a policy which holds that all substantial reductions in operating costs are dependent upon commensurate reductions in rates of compensation of railway employees. He intimated, in fact, that almost all the reductions in operating expenses recently secured have been due to reductions in the compensation of employees. The average compensation of railway employees is still higher per hour, per day and per month than it was at any time under government control, although lower than it was in the latter part of 1920 and in 1921. The average cost of coal per ton is also higher than it was at any time in 1919, although less than it was in the latter part of 1920. Now, in the five months ended March 1, 1920, which were the last five months of government control, the total operating expenses of the railways were $2,043,000,000. In the five months ended March 1, 1921, they were $2,378,000,000. In the five months ended March 1, 1923, they were $2,028,000,000. This represents a reduction of $15,000,000 as compared with the last five months of government control in spite of the shop employees' strike, higher wages, higher prices of coal and the handling of more freight business. Operating expenses in January and February were $48,000,000 less than in the same months of 1920 under government control. The reduction in the five months was $350,000,000 as compared with the five months ended March 1, 1921. Most of this reduction of operating expenses has been due, not to reductions of wages, but to reductions in the number of employees, of whom there are now about 135,000 less than at the termination of government control. Most of the benefit of the reductions in operating expenses which have been secured within the last two years already has been passed along to the public in reductions of freight rates which, on the basis of the business now being handled, amount to about $600,000,000 a year.

We are sure that when Senator Couzens studies the matter more thoroughly he will become convinced that while private management of our railways has its shortcomings, it is on the whole efficient, and that what it has accomplished and what it is now accomplishing better deserves commendation than criticism.

A Needed Campaign of Education

AMERICAN POLITICAL INSTITUTIONS and private property in this country are being put in jeopardy by two different influences.

One of these influences is the propaganda carried on by radicals against "capitalism" and our "capitalist government." This propaganda includes the advocacy of various kinds of peaceful sabotage, and even of virtual confiscation, to make private management of business unprofitable and even impossible.

The second influence which menaces our political and industrial institutions is the extreme devotion of the brains of the country to short-sighted efforts to increase profits and the indifference shown, and even the ignorance betrayed, by financial and industrial leaders concerning the radical propaganda mentioned.

It is difficult to decide whether the future of the country is being jeopardized more by the attacks being made upon our political and industrial institutions by radicals, or by the failure of the leaders of business to adopt measures to prevent these attacks from accomplishing their purpose.

Public officials in Michigan are conducting criminal proceedings against a group of men who recently held a national convention in that state to promote the establishment of communism and the "dictatorship of the proletariat" by violence. Men are frequently arrested in different parts of the country for advocating the use of violence to overthrow existing institutions. Men who commit or advocate violence for any purpose should be prosecuted. But criminal proceedings against radical agitators, even though they result in convictions—and usually they do not result in convictions—will not arrest the radical movement. There are various reasons why this is so, but the principal one is that a very large majority of the men who are efficiently disseminating radical propaganda do not advocate communism or its establishment by violence, and are therefore not subject to prosecution.

The most dangerous propaganda being carried on consists of the wilful and outrageous misrepresentations of our political institutions, especially the Supreme Court of the United States, and of all large business enterprises, which are disseminated, not only by socialists and communists, but by all radical politicians and by most leaders of organized labor. Almost all radical politicians and labor leaders and publications having the radical point of view wilfully and grossly exaggerate the profits made by large business concerns of all kinds. They represent that the alleged huge profits made by the railroads and other large concerns are secured by paying "wage slaves" starvation wages and by charging the public extortionate freight rates and prices. They attack the government, and especially the courts, upon the ground that they are controlled by the large moneyed interests. Some of them openly advocate socialism. Others advocate government ownership of the railroads, the coal mines and public utilities, which would be a long advance toward complete socialism. Still others merely advocate confiscatory forms of regulation of railways and other large business con-

cerns which would be as bad, while they prevailed, as government ownership and probably would make government ownership unavoidable. Most of them advocate legislation to curtail the authority of the courts to issue injunctions and hold laws unconstitutional, which would make it almost impossible to prevent wholesale violence in extensive strikes and render it easy to put into effect confiscatory laws. Propaganda of this kind is being constantly carried on throughout the country by the Hearst newspapers, by certain groups of farm papers, by labor leaders and labor publications, and by radical politicians such as Senators La Follette and Brookhart, as well as by communists and socialists.

The influence exerted by this kind of propaganda when widely and persistently carried on among large numbers of people, is strikingly illustrated by the effects it has had upon the opinions and attitude of railway employees. Within a comparatively few years it has turned most railway employees into bitter enemies of the federal courts and of private ownership and management of railroads. It has had the same general effect upon most members of labor unions. Almost unconsciously they have become radicals in their feelings and opinions regarding the entire existing economic and industrial system, the constitutional provisions which safeguard it, and the courts which interpret and apply these provisions. Radical sentiment also has been spreading among the farmers, especially in the western states where they have been sedulously taught by certain public men and publications to suspect and hate the railroads and other large business concerns because of alleged iniquities in their management and the alleged extortion practiced by them upon the public. There are only about three million farmers in the country who own their farms. There are about three millions tenant farmers and a still larger number of farm laborers. The effects which might be produced by the development of a radical sentiment among these tenant farmers and farm laborers that would cause them to join forces with radical labor in attacks upon existing political and industrial institutions are not difficult to imagine.

The danger in such a situation is due to the fact that when large numbers of people have aroused in them a feeling that they are being wronged they may yield to the leadership of those who advocate the most extreme measures for redressing their supposed wrongs. We have seen this danger recently illustrated by the election to Congress from the western states of a large group of extreme radicals who have assumed to speak for both labor and the farmers. We see it even more strikingly illustrated in Great Britain, where a small number of socialists have seized political control of the entire labor movement, and, as the second strongest party in Parliament, are advocating a huge levy upon capital to pay the national debt, the nationalization of railroads, coal mines, shipping and land and other measures the adoption of which would destroy all private enterprise and establish a socialist state.

There is only one effective way to combat this radical propaganda. It cannot be successfully combated merely by prosecuting a few men, or even by putting them in jail. The only way it can be successfully combated is by a campaign of education in defense of private enterprise and the political institutions which safeguard it carried on as extensively and energetically as is the propaganda to destroy them. Our leaders in finance and business, including the chief executive officers of the railroads, could not do anything better for the interests that they represent, or for the nation, than to initiate, finance and direct such a campaign of education among all classes of people, and especially among workingmen and the farmers. The people need to be told the facts about business and business management. They need to be taught the elements of economics. They need to be shown why private ownership and private enterprise are to their interest, and why private ownership and private enterprise cannot be successful if subjected to extreme forms of government regulation and restriction. They need to be shown why socialistic legislation, whether applied in the form of regulation or taxation, is injurious to all classes of people, and why actual socialism would be ruinous to them.

How long it will be before the leaders of finance and business will awaken to the need for such a campaign of education is a matter for surmise. They certainly are not awake to the need for it now. They are very busy trying to increase the efficiency of production and to enlarge their own fortunes or the fortunes of those that they represent. Most of them recognize the fact that the most serious obstacles that they encounter are the "inefficiency" of labor, and burdensome tax laws and burdensome laws of other kinds. Most of them do not recognize the fact that these obstacles, which are growing increasingly difficult to overcome, are indirectly but mainly due to the growth of radical sentiment which increasingly causes the practice of peaceful sabotage among workingmen and the passage of legislation that is hostile to all forms of big business and especially, of course, to the railroads.

Most business men are glad to see the communistic advocates of violence prosecuted. But their prosecution will do little to arrest the growth of radicalism, and will accomplish little or no good, as long as the leaders of business are so blind to what is going on around them and so intent upon grasping all the profits that are immediately in sight, that they will do little or nothing to help combat the radical propaganda which already is making it practically impossible to conduct some industries, such as the railroads, profitably, and which is being carried on to destroy all private property and private enterprise.

Should Railways Co-Operate with Standards Committee?

INDIVIDUAL INITIATIVE has played an important part in placing American industries on a high plane of efficiency. At the same time the unrestricted play of this initiative has not been without its disadvantages, principal among which is the multiplicity of designs or methods for the same or similar objects. Much of this duplication has little or no justification and, therefore, constitutes a tax on industry because of increased costs resulting from the multiplicity of standards.

The organizations now constituting the Mechanical and the Signal sections of the American Railway Association and the American Railway Engineering Association have long been engaged in the standardization of materials used by the railways and have been instrumental in the elimination of much duplication in this field. More recently the American Engineering Standards Committee has been organized to harmonize the many designs in different industries in a smaller number of standards which will meet the requirements of the users equally well. In spite of the short time that this committee has been in existence it has much constructive work to its credit.

In another column in this issue, Albert W. Whitney, chairman of the American Engineering Standards Committee, gives reasons why the railways should enter actively into the work of that committee. Up to the present time their participation has been largely nominal and there is a wide difference of opinion regarding the advisability of lending more active support to this organization.

This difference of opinion arises largely from the angle from which the subject is approached. The railways use many materials in common with other industries. They also constitute the almost exclusive market for others. As far as

materials used in common with other industries are concerned, there would seem to be little reason to question the advisability of participation by the railways in the work of standardization and simplification of manufacture. By participation in this work the railways can insure that their particular requirements are given adequate consideration and that the standards selected are suitable in all respects for their needs. Furthermore, by reason of having participated in the development of the standards, they will have a responsibility to see that these standards are used in railway service and thereby increase their effectiveness and the economy resulting from their universal adoption.

It is with reference to the second class of materials or those used principally or exclusively by the roads that the strongest grounds for differences in opinion exist. On the one hand, there are those who believe that the railways should submit these standards to the committee for consideration, while on the other are those who oppose this procedure on the ground that the railways are most familiar with the needs of their service and should not assign control over such standards to an outside body. Furthermore, the value of the service which an outside organization, such as the Engineering Standards Committee, can render in such cases here is doubtful.

It is in work of this character that the railway associations have concentrated for years and, while the adoption of the standards recommended by these associations is far less general than is desired, marked progress has been made. As R. H. Aishton, president of the American Railway Association, pointed out at the recent convention of the American Railway Engineering Association, the members of the railway associations have not been as diligent as they should be in selling to their managements the standards which they have voted to adopt in convention, with the result that many standards which represent the conclusions of the best talent in the railway industry remain inoperative. The problem of securing the universal adoption of these standards is one within the railway industry, which should and must be solved by the associations serving that industry and in which an outside organization can render little assistance. It was the thought of many members of the American Railway Engineering Association when the Committee on Standardization of that organization was created that it would be the principal function of this committee to bring about the adoption by the roads of the standards of that association. It is to be regretted that this work has received little attention to date from this committee for herein lies its most important field for service.

Rational standardization is desirable so far as it tends to eliminate unnecessary duplication of designs. Because of the valuable service which the American Engineering Standards Committee can render all industries, including the railroads, the railways should support it and should participate actively in its work, insofar as it relates to the standardization of those materials and designs which the railways use jointly with other industries. Through their representatives on this committee the railways should also urge the committee to confine its activities, insofar as the railways are concerned, to that work in which other industries are interested jointly with the railways.

New Books

The Transportation Act, 1920—Sources, History, Text, Rulings, Interpretations, etc. Compiled by Rogers MacVeagh, 968 Pages. 6 in. x 9 in. Bound in Cloth. Published by Henry Holt & Co., New York.

This book is a production of a somewhat unusual sort. It is intended to be a complete record of the Transportation Act. As such it deals with the sources, history and text of the law, together with the various interpretations of one sort or another which have been promulgated since the passage of the act up to and including August 18, 1922. There is given a detailed comparison of the changes in the law which the Transportation Act put into effect. The material of the book comprises extracts from reports and debates in Congress, rulings, interpretations and decisions of the Interstate Commerce Commission, opinions of the United States Supreme Court, prescribed forms and complete texts of related acts, including the Federal Control Act, the Merchant Marine Act of 1920, etc. To quote the author's own introduction, "the collection is intended neither as a legal text-book, nor a treatise for students of traffic questions, nor an essay, nor an argument pro or con, but simply a 'source-book,' where any one—lawyer, legislator, traffic man, shipper, newspaper man, economist, manufacturer, professor or ultimate consuming citizen, interested in what vitally affects his present and (still more) his future—may, it is hoped, find the materials he wants in accurate and convenient form."

Of the book's total of 968 pages, the first 516 are devoted to the text of the act and explanatory matter. The text has been partitioned into so-called "text divisions," each bearing a consecutive number and accompanied by a description briefly and suggestively worded. Generally, these text divisions correspond to paragraphs or sections in the text. Groups of such text divisions are arranged by subject, and explanatory or otherwise related matter added. In this way the explanatory matter will be found immediately following the text to which it refers. Thus, in a typical section there will appear the text of the act itself, followed possibly by the paragraph dealing with the section quoted from the report of the house committee on interstate and foreign commerce, and possibly by portions of speeches made in the house and senate with reference to the provision under consideration, sections from the conference committee report, and possibly portions of decisions of the commission and court which explain, amplify or put into effect the text of the act.

The latter part of the book is an appendix containing in small type a remarkable assembly of material relating to the Transportation Act. There are given the text in full of all the several bills which were introduced when the laws relating to railroad regulation were under consideration, including the Esch bill as presented in the House of Representatives, the Cummins bill as presented in the Senate, the bill which contained the Plumb Plan, and speaking generally, the text of the several bills which were finally formulated in the Transportation Act itself. Further than that, the appendix contains a miscellaneous lot of material such as the text of the Federal Control Act, the proclamation by which the president relinquished control over the railroads, the text of the standard contract and the other agreements made between the director general of railroads with the companies under federal control, etc. There is also given a tabular comparison of the standard return of the carriers and their net operating income during the federal control period, a list of the railroads which accepted the guaranty for operation during the guaranty period, the commission's decisions in Ex Parte 74, in the New England Divisions Case and in the Reduced Rates Case of 1922, etc.

It is hardly necessary to enlarge to any great extent upon the value of a book of this kind. It is, of course, common sense to say that it is impossible to secure an absolute complete understanding of the Transportation Act without a study of the discussion which was carried on prior to its passage, or without a complete understanding of the several things which have taken place under its guidance, or without a knowledge of the interpretations which have determined the manner in which it shall be followed. The compiler of the book has engaged in what must have been a truly imposing task, but he has rendered a real service in putting between the covers of a single book all this important, related and basic material.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated, The editors do not hold themselves responsible for facts or opinions expressed.*]

More About the "Mileage Hog"

SAN ANTONIO, Texas

TO THE EDITOR:

My attention has been called to an article in the March 17 issue of the *Railway Age,* page 77, by Ben W. Hooper, chairman of the United States Railroad Labor Board, and particularly to the paragraphs headed "Political Traitors as Bad as Strikebreakers," which quotes a virulent attack on "certain individuals claiming to be brotherhood men" who were reported to be working for the election of Albert J. Beveridge as senator from Indiana. The official organ of the Brotherhood of Railroad Firemen and Enginemen is quoted concerning them: "These individuals or any other brotherhood or union members, who may be contemplating a course of this kind, might as well understand that their support of Beveridge and men like him will mean that they will be classed with strikebreakers in the estimation of all honest wage earners who know their perfidy."

I want to ask, when was the political conscience of the members of the brotherhoods put in the keeping of the salaried officers of these organizations? I want to go on record that a man who has so little of the spirit of American manhood as not to resent such dictation is no better than a scab. And I speak as one who has contributed to the meal ticket of this Czaristic official for many years. There is nothing in the obligation of membership that prohibits one from following the dictates of his own conscience in political matters.

Instead of smothering the consciences of the membership and making automatic voting machines of them, it would be more in keeping with the duties of these officials to make some efforts to protect the interests of the rank and file in that most important function of the right to equality of opportunity for employment.

The legislative representatives of the four brotherhoods in Wisconsin have broadcast through the official journals a statement based on the assertion that "America does owe to every born soul an opportunity to earn a livelihood"; and asks "why doesn't America give us that opportunity?" Let me ask: What are the brotherhood officials doing in their own particular sphere to open up these opportunities? The enforcement of the provisions of the Adamson eight-hour law would go far in times of the worst depression to absorb this army of unemployed in their own ranks.

Not only is it their duty to their membership to take this course, but they are obligated by pledges made before the enactment of this law, as a matter of honor, and in the interest of the public as well as of the employees, to insist on the rigid enforcement of the terms of the law, just as it is applied to employees in the yard service. The able chief of the B. of L. E., W. S. Stone, one of the highest paid labor leaders in the world, forcefully points out the evils of unemployment in an official pronouncement in the May, 1922, issue of the Engineers' Journal, from which I quote: "The sordid results of unemployment are not confined to mere physical suffering. The court records of every large city in the country show that crime is on the increase. The number of suicides alone is 23 per cent greater than last year. Homes are broken up because the natural breadwinners can no longer provide a livelihood. Charitable organizations are besieged with pleas for aid from women whose husbands have deserted, not because they are evil men, but because they are without money and without work, and feel that one mouth is much easier fed by charity than two."

Mr. Stone's indictment of a social system that permits "two per cent of the people to own 70 per cent of the wealth of the country" may well cause serious thought, but what may be said of the statement made by him at the Cleveland convention of the Order of Railway Conductors that "two and a half per cent of the members of that order were at that time drawing 25 per cent of the entire earnings of the membership"—and this five years after the Adamson law had gone into effect. It must be remembered, in this connection, that the brotherhoods' publicity committee, in urging the passage of this law, said: "Excessive hours and the terrific strain shatters the health and shortens the lives of these men. The employees are not asking for more pay; only that their working hours may be less." Since this law has been on the statute books, can a single instance be cited where these officials have made any honest effort to shorten the hours or reduce the mileage to conform to the letter or the spirit of the law, even though thousands of their members were reduced to direct want through unemployment? When it is considered that this unemployment jeopardizes the insurance carried in the brotherhood, to protect their families from want in case of death or disability, the do-nothing policy pursued is absolutely indefensible.

I will admit that a gesture in the direction of the recognition of the eight-hour law was made in the adoption of the so-called "Chicago Agreement" of the engineers and firemen, though this has become but a scrap of paper on many roads, and itself recognized 38 legal maximum days as the accepted monthly maximum approved by the agreement.

While the business revival has removed the menace of unemployment to a certain extent, and has created a feeling of optimism that is reflected in the statement by the American Railway Association that the railroads are preparing to spend $1,100,000,000 in improvements and equipment, it calls attention to another phase of the situation that is of equal importance. The long continued policy of operating the lines with a minimum of train crews has prevented the building up of the force of train service employees to care for the expanding business. As at present constituted there is an insufficient number of experienced, competent men to give proper training and supervision to the army of new men necessary to be drafted into the service in the near future. The *Railway Age* has frequently called attention to the fact that the train service employees are the only class that are essentially railroad men—not readily interchanged with other industries to be brought back into railroad service as required. They are made, not born—and made at a great expense and to the detriment of the service and danger to the public while being trained, especially if not adequately supervised.

While thus placing upon the brotherhoods a large share of the responsibility for the absolute failure of the Adamson act to function for the benefit of the public, the employees and the railroad owners, as promised in the agitation for its passage, I do not want to be understood as exempting the railroad managers themselves from a share in this responsibility. The recognized improvement in yard conditions, resulting from the rigid enforcement of the law in the case of the switchmen, was commented upon by the Lane Commission after thorough investigation soon after the law became operative and should have led to a keener insight into probable benefits to be derived from the extension of this strict enforcement to the train service employees. Henry T. Hunt, the public representative on Board No. 1 under the Railroad Administration, stated that while "wage rates

are fixed (by the Labor Board) at so much per mile, hour, day or month," the decision is based in part on the assumption that the employment will be fairly continuous. "Without opportunity to work, which is controlled by the managements, wage rates will not buy one pound of flour." This brings us back to the uncontrolled "mileage hog." Does Mr. Hunt's statement justify the brotherhood spokesmen in "passing the buck" *in toto* to the managements?

In view of the fact that representatives of the brotherhoods have been on every board having to do with the operation of the roads and the settlement of disputes arising as to conditions of employment since the adoption of the Adamson law, I should like to ask Mr. Hunt or any member of the present Labor Board if they can cite a single instance where brotherhood spokesmen have made any serious effort to protect the interest of their unemployed members.

Arthur Nash, a clothing manufacturer who has become famous through the application of what he calls the "golden rule in business" has said: "Solve the human problem and the railroads will run themselves." When the brotherhoods and the managements co-operate in solving this human problem on the railroads the results will redound to the benefit of the public, the roads and the employees. I believe it can be done.

F. J. BAILEY.

The Motionless Train vs. Remote Controlled Switches

COLUMBUS, Ohio.

TO THE EDITOR:

A letter to the editor entitled "The Motionless Freight Train" appeared on page 851 of the *Railway Age* for March 31. To satisfy the inquiry in the above mentioned letter, I am attaching a report on one of these remote controlled passing track switches. The computations are based on the principles used by the Signal Section's Committee No. 1 on "Economics" with a few new thoughts added. This report is on eliminating the manual operation of passing track switches by connecting them to adjacent interlocking plants, or other existing points of operation.

1. Location—Switch at north end of passing track at Centerburg, Ohio. Manual block signal territory, approach on an 0.8 per cent grade—north bound service, January, 1922.
2. First cost of installation (remote control)..... $5,100.00
3. Average number of train stops avoided per month (based on November, 1922) for heading in..... 78
4. Average number of train stops avoided per year account heading in 936
5. Average time loss avoided per train per stop for heading in 8 min.
6. Train crew wages per stop avoided (straight time)..... $0.51
7. Savings per year of train crew wages, account time gained heading in $477.36
8. Coal saving per train by avoiding stop—average..... 700 lb.
9. Coal savings per year account avoiding 936 train stops at $3 per ton, plus 15 per cent for handling and docking, plus $1.89 freight per ton, Corning-Bucyrus (192.6 tons)..... $1,048.00
10. Adding items 7 and 9 shows a saving of..... $1,525.36 by eliminating train stops for heading in to and out of siding (equals $1.63 per stop).
11. Allowing $500 per year for interest on investment, depreciation and repairs leaves a net saving per year of..... $1,025.35
12. Net saving per year, not counting damage to equipment on account of general wear and tear, and draw-bars pulled out, etc., or not counting car and engine hours saved, amounts to 20.5%
13. If each stop saved was figured at $5.06 (based on coal conservation data in the New York Central Lines Magazine for October, 1921, page 38) the net savings per year would be $4,657.36, or..... 93½% on the investment, not counting car and engine hours saved, and not counting the additional advantages gained by being able to clear the manual block quicker, which effectively "shortens the block" and increases the capacity by cutting down delays to other trains.
14. (a) Average freight train running time on this division..12 hrs. 30 min.
    (b) Average cars per freight train..... 43
    (c) Average freight trains per day heading in on this passing track 3
    (d) Minimum average running time saved per freight train by avoiding stopping at the switch which is handled by remote control..... 8 min.

equals 0.938 per cent of the total running time =
.133 train and engine hours
And 3 trains per day = a savings of.. .400 train and engine hours
At 43 cars per train = ... 17.2 car hrs.

15. Cars and engines saved (see item 13).

(a) Cars saved $= \frac{\text{car hours per day}}{\text{hours per day}} = \frac{17.2}{24} = 0.717$ cars saved.

The foregoing presumes all of the car hours are in running time, but the average time required for the average car to make the cycle from the loading point at the mines to destination, unload and return and reload, allowing three days for unloading is about 7 days, therefore, the net cars saved equal $0.717 \div 7 = 0.102$ cars saved

(b) Value of the cars saved = 0.102 at $1,200 = ... $124.00
Cars saved, of course, means that it will be possible to handle the same business with 0.102 less freight cars which can be sold, or if it is desired to retain them to handle more business, then for the purpose of this report, it would be advisable not only to take credit for the first cost, but also for the earning power of the cars so saved, after deducting the maintenance, depreciation, etc.

(c) Operating expense saved per year on 0.102 freight cars released = 16 per cent of $124 = ... $25.60

(d) Locomotives saved $= \frac{\text{locomotive hours per day}}{\text{hours per day}} = \frac{0.400}{24} = 0.1067$

This presumes that all locomotive hours are in running time, whereas the records show that on American railways, only 8 hours out of every 24 are spent in road service, therefore, the saving is effective only one-third of the day. Therefore, the net locomotives saved = $0.0167 \div 3 =$ .....0.0056 locomotives saved

(e) Value of locomotives saved = .0056 at $20,000 (ledger value) = $112.00

(f) Operating expense saved per year on 0.0056 locomotives released = 26 per cent of $112..... $29.00

16. Reducing effective time in manual block (See item No. 13)

17. Recapitulation:

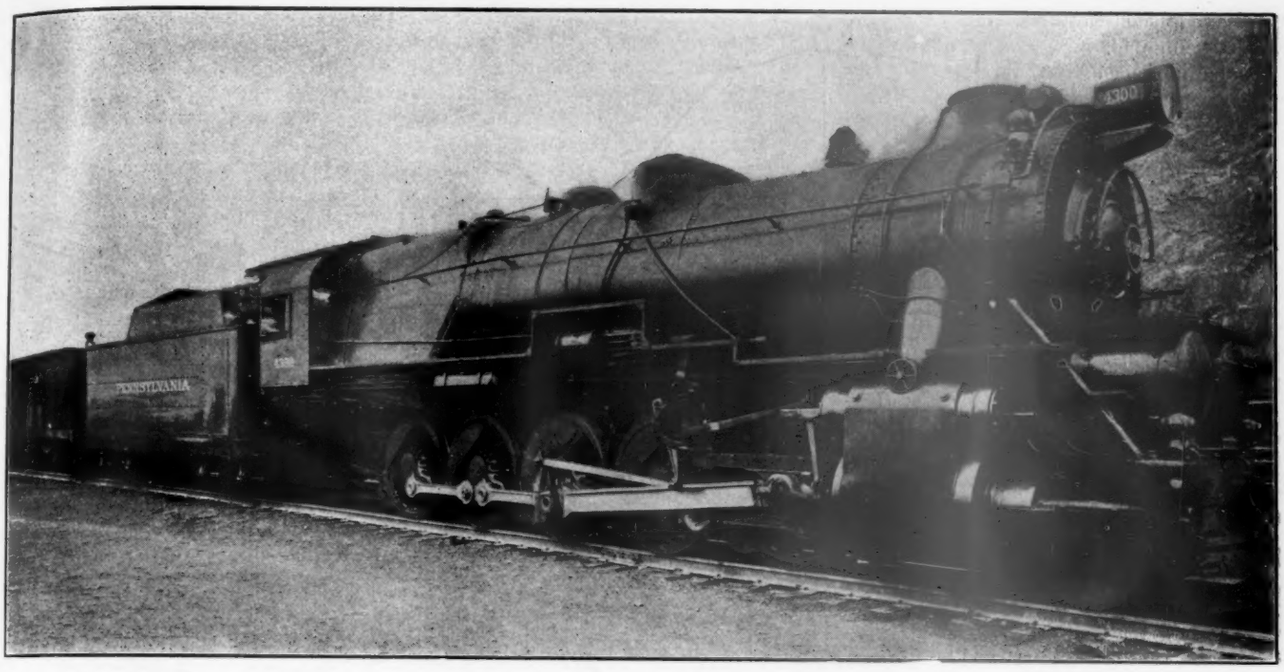
(a)	First Cost	
	(1) Remote control of switch.....	$5,100.00
	(2) Locomotives saved (not incl. Item No. 16)..Cr.	112.00
	(3) Cars saved (not incl. Item No. 16).....Cr.	124.00
	(4) Net total first cost.....	$4,864.00
(b)	Operating Cost Per Year:	
	(1) Crew overtime saved.....Cr.	$477.36
	(2) Maintenance and depreciation on remote control Cr.	500.00
	(3) Fuel saving .....Cr.	477.36
	(4) Savings on repairs due to avoiding 938 freight train stops per year.....Cr.	
	(5) Savings on account of maintenance and depreciation saved on the cars eliminated (not incl. Item 16) .....Cr.	25.60
	(6) Savings on account of maintenance and depreciation saved on the locomotives eliminated (not incl. Item 16).....Cr.	29.00
	(7) Net total operating cost per year.....Cr.	$1,079.96
(c)	Interest earned on the investment of $4,864 (Item 17—A4)	22.2%
(d)	Counting fuel savings, also the equipment repair savings, due to avoiding train stops, at a total of $5.06 per stop (See Item 13), the net savings per year would be.....	4,711.96
	And the interest earned on the net investment of $4,864 would be.....	96.7%

I feel that the above data are conservative, and the actual gain would be in excess of the value shown. The report is in such a form that others can determine the savings which could be accomplished by similar installations at certain locations on their system by interpolation.

B. J. SCHWENDT
Superintendent Signals, Toledo & Ohio Central.

SEVEN HUNDRED FARMERS and farm laborers recently arrived in Ontario and other places in Canada, all having come from Europe on a single steamer.

PROMPT REPORTS TO SHIPPERS are now made on the Delaware, Lackawanna & Western, in all instances where freight is received at destination in bad order and the damage is due to the shipper's fault; as, for example, where goods are in damaged or pilfered condition because of improper packing, inefficient crating, poorly constructed boxes, improper nailing, etc. Although the policy has been in effect but a short time, many shippers have indicated their willingness to improve packing practices. The company means to thoroughly investigate all cases of loss and damage before taking the matter up with the shipper, so as to be sure that the conditions are chargeable to him and not to improper handling by railroad employees.



One of the New Decapod Type Locomotives in Service on the Pennsylvania

Moving 6,700 Cars Daily Over the Alleghenies

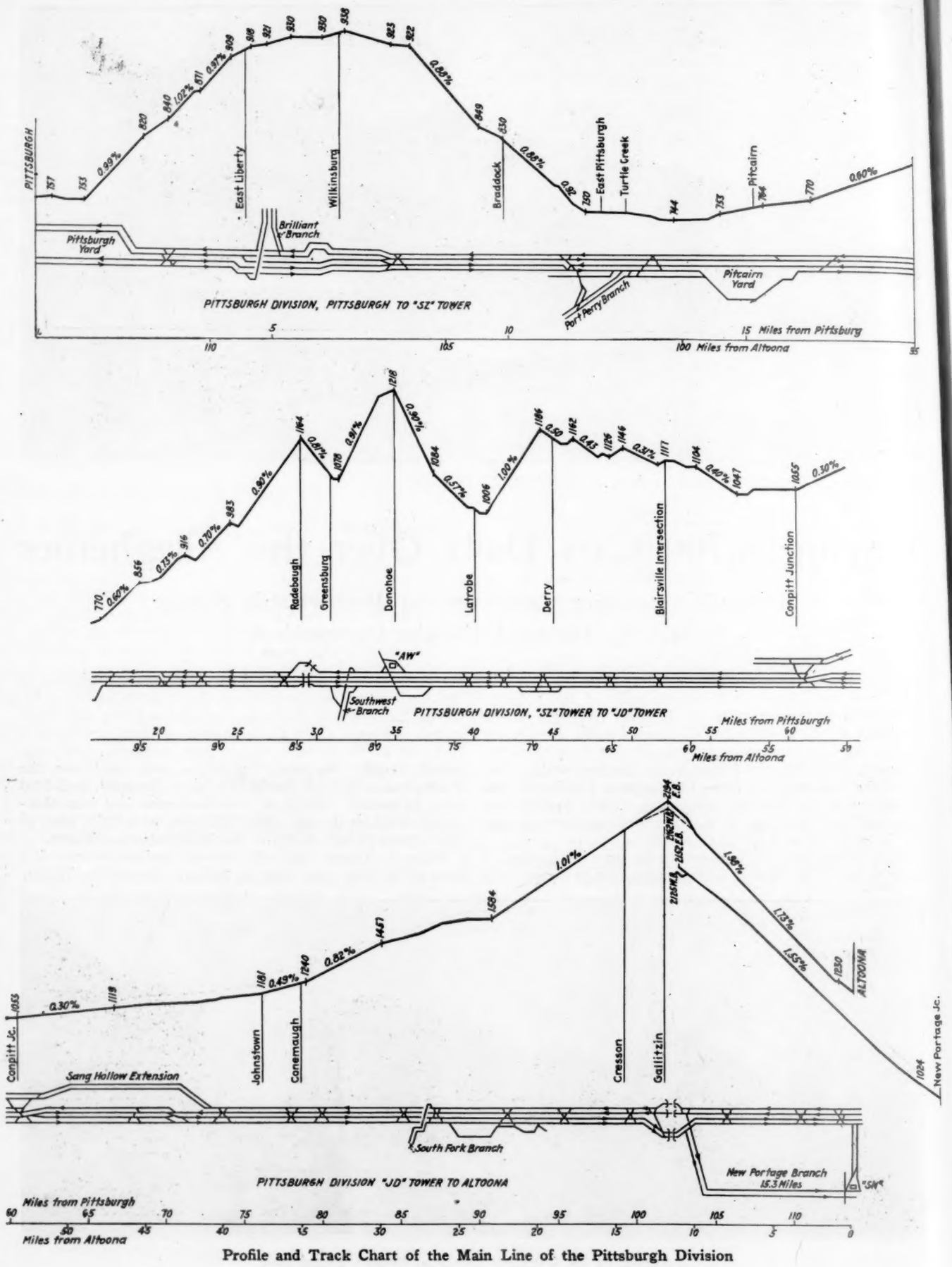
Difficult Operating Conditions on Pennsylvania System Met by Decapod Freight Locomotives

THE PENNSYLVANIA SYSTEM normally moves about 11 per cent of the entire freight traffic of this country. A large proportion of the business converges in the Pittsburgh territory, which has the greatest traffic density and some of the most intricate operating problems to be found on any road. The Western Pennsylvania division, which comprises the 114 miles of main line between Pittsburgh and Altoona with its branches, dispatches 12,000 loaded cars daily and loads as many as 4,300 cars of coal alone in one day in addition to 1,200 cars of coke.

It is evident that such heavy traffic must be hauled in large trains or the number of movements would exceed even the capacity of a four-track line. The grade conditions in this territory are not favorable for heavy train loading. Although the section of the main line between Derry and Conemaugh has only slight grades, there are heavy grades near each end of the division against both eastbound and westbound freight. To meet these severe grade conditions, the Pennsylvania in 1916 developed a heavy Decapod, or 2-10-0 type, locomotive. After the first locomotive had been thoroughly tried on the test plant, 122 more were built, most of which were placed in service on the Pittsburgh division.

When in August, 1922, the railroad decided to order 100 more of the same type from the Baldwin Locomotive Works,

Decapods on the Outbound Tracks at Pitcairn Roundhouse



Profile and Track Chart of the Main Line of the Pittsburgh Division

the design was modified slightly and a feedwater heater added. In January, 1923, an additional order for 375 of this later design was placed with the same builders. Deliveries are being made on the last lot and these locomotives are now used on the majority of freight trains between Pitcairn yard, east of Pittsburgh, and Altoona. Some are also in use on other divisions of the Central Region.

Cut-off Arrangement Effects Remarkable Economy at Low Speed

The object which the officers of the Pennsylvania motive power department had in view in designing the Decapod type was to develop a locomotive which would deliver about 25 per cent greater tractive force than the Lls Mikado type which had previously been the standard equipment for freight service. Inasmuch as the Decapod was intended especially for slow speed service over heavy grades, it was designed with the view to obtaining the maximum economy possible under these conditions. This object was attained by limiting the maximum cut-off in the cylinders to 50 per cent of the stroke, thus obtaining the economy resulting from expansion of the steam even when developing the maximum tractive force. Tests on the locomotive testing plant at Altoona showed that when working with maximum cut-off at a speed of 7 m.p.h., the steam consumption of the Ils was only 19.5 lb. per horsepower hour, as compared with 31.5 lb. for the Lls under the same conditions, a reduction of 38 per cent. Throughout the entire range of operation, the Decapod showed a saving in coal per horsepower hour over the Mikado, ranging from 8 per cent to 23 per cent.

Table I—Principal Dimensions, Weights and Factors of Pennsylvania Decapod and Mikado Locomotives

	Decapod I1s built in 1922	Decapod I1s built in 1918	Mikado L1s
Weight of locomotive in working order	371,800 lb.	371,800 lb.	320,700 lb.
Weight on drivers in working order	341,000 lb.	341,000 lb.	240,200 lb.
Tractive force	90,024 lb.*	90,024 lb.*	61,465 lb.†
Driving wheels, diam.	62 in.	62 in.	62 in.
Cylinders, diameter and stroke	30½ in. by 32 in.	30½ in. by 32 in.	27 in. by 30 in.
Wheel base, driving	22 ft. 8 in.	22 ft. 8 in.	17 ft. ½ in.
Total, eng. and tender	73 ft. ½ in.	73 ft. ½ in.	73 ft. 3½ in.
Boiler pressure	250 lb.	250 lb.	205 lb.
Tubes, number and diameter	114—2¼ in.; 400—1⅞ in.	244—2¼ in.; 192—1½ in.	236—2¼ in.; 160—1½ in.
Flues, number and diameter	200—3¼ in.	48—5½ in.	40—5½ in.
Evaporative heat. surf.	4,808 sq. ft.	4,332 sq. ft.	4,050 sq. ft.
Superheating surface.	2,469 sq. ft.	1,460 sq. ft.	1,215 sq. ft.
Grate area	68.89 sq. ft.	69.89 sq. ft.	70 sq. ft.
Feedwater heater	Worthington	None	None
Stoker	Duplex	Duplex	None

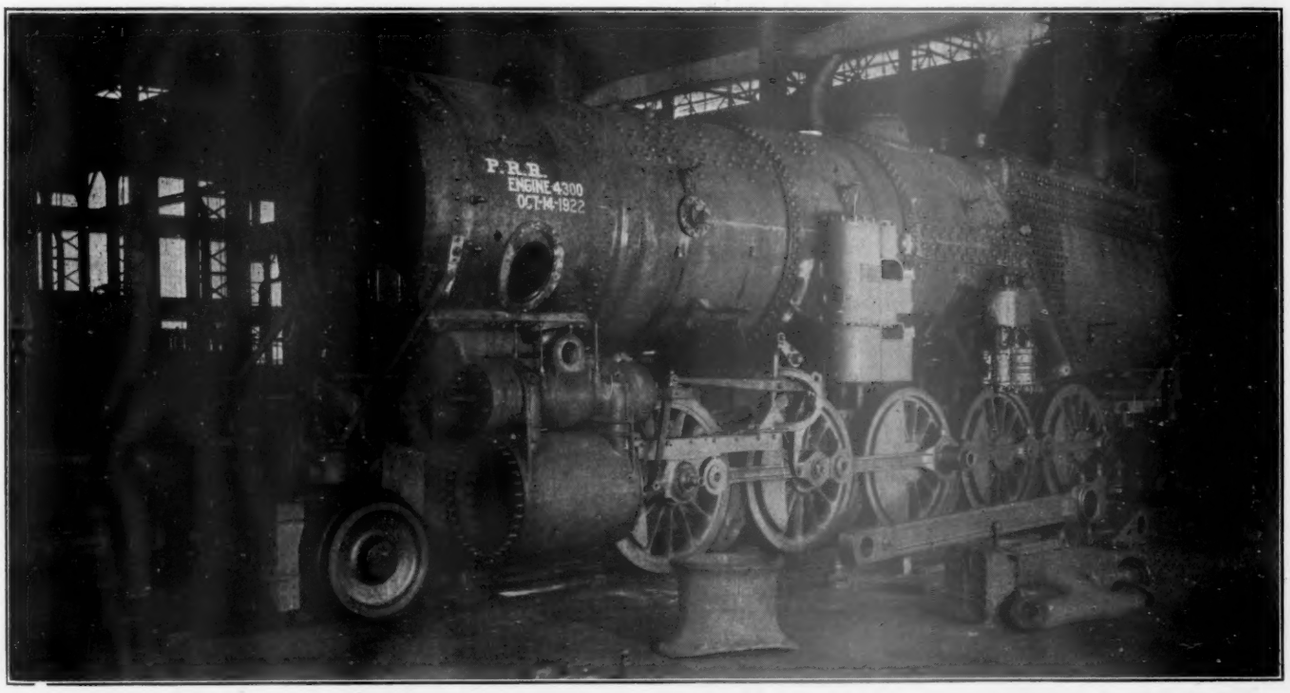
*Based on 75 per cent of boiler pressure.
†Based on 85 per cent of boiler pressure.

A comparison of the Lls with the Ils as built in 1916 and as modified in 1922 is shown in Table I. The size of the boilers on the three designs is practically the same. The Decapods carry a higher boiler pressure and the latest design has a Type E superheater instead of the Type A. With an increase in total weight from 320,700 lb. to 371,000 lb., or 16 per cent, the tractive force has been increased from 61,465 lb. to 90,024 lb., or 46 per cent.

Operating Conditions on Western Pennsylvania Division

A good idea of the performance of the Ils locomotives can be gained by considering the operation of the Western Pennsylvania division. As will be noted from the profile, there is a sharp, almost unbroken ascent from Pitcairn yard to the summit at Donohoe, a descent to Latrobe and a long heavy grade to Derry. The maximum grade against eastbound trains over this section is 1.00 per cent, and against westbound trains 0.90 per cent. From Derry to Conemaugh the line is comparatively level, the ruling grade eastbound being 0.30 per cent and westbound 0.43 per cent. After leaving Conemaugh there is a long climb to the summit at Gallitzin, with a continuous grade of 1.01 per cent for 10 miles and a short maximum grade of 1.53 per cent near the summit. From Gallitzin there are two routes down the mountain: the main line to Altoona, with a maximum westbound ascending grade of 1.98 per cent, and the New Portage branch to Hollidaysburg with a 1.60 per cent maximum grade westbound.

The yard at Pitcairn is the assembling point for freight from the west and also from the coal fields on the river branch of the Monongahela division, the latter alone furnish-



First of the 475 L1s Locomotives Nearing Completion at the Baldwin Locomotive Works

ing as high as 1,100 cars a day. The average daily traffic from the Eastern Ohio division (Fort Wayne route) is 350 cars, and from the Panhandle, 250 cars. The average eastbound movement out of Pitcairn for Blairsville Intersection, Conemaugh and Altoona, is 1,700 cars, or 36 trains. During March, 1923, the Pitcairn roundhouse dispatched 4,333 freight locomotives, exclusive of yard power.

At Youngwood, freight originating on the Southwest branch of the Monongahela division, consisting principally of coal and coke from the Connellsville region, is assembled. This amounts to about 500 cars daily, most of which moves eastward. With the addition of traffic from other small branches, the total movement over the main line past Conpitt Junction is 1,800 cars daily. In addition, about 1,000 cars move over the Conemaugh division, which joins the Pittsburgh division at this point. At South Fork the coal from the mines around Windber comes onto the main line, and at Cresson, traffic from the Cresson division is received. The total daily freight movement over the Allegheny mountains and past Gallitzin is now about 3,200 cars eastbound and 3,500 cars westbound. Some conception of this traffic can be gained from the fact that it is equivalent to moving more than two cars each way for every minute of the 24 hours. The trains moving in each direction daily, if placed end to end, would cover over 26 miles of track.

Three Locomotives for Each Freight Train

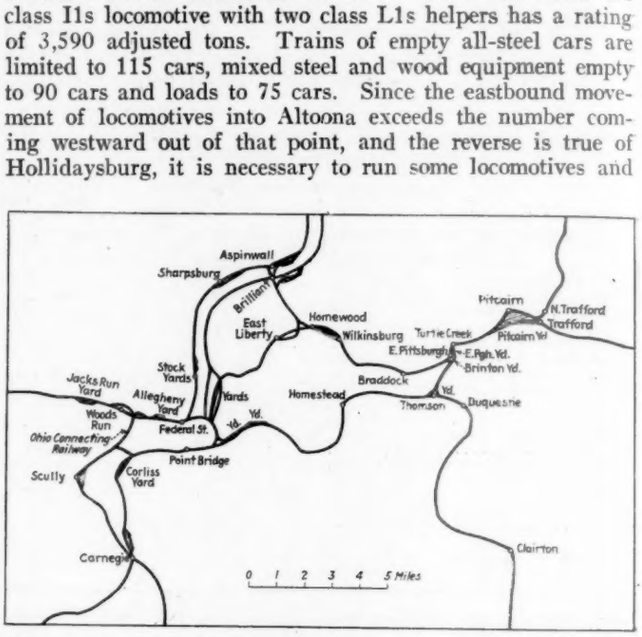
Trains out of Pitcairn headed with a class I1s Decapod locomotive are ordinarily given two L1s Mikado type locotives as helpers to Derry, the total loading for the train be-

Map of Pennsylvania System Lines in Western Pennsylvania

ing 5,230 adjusted tons, which is the mountain rating from Conemaugh to Gallitzin for these three locomotives. This tonnage can then be handled by the Decapod locomotive from Derry to Conemaugh where two more helpers are put on to take the train to Gallitzin. From Gallitzin most of the eastbound trains run over the main line to Altoona yards. Even with this heavy tonnage, on some days it is necessary to operate as many as 65 freight trains between Conemaugh and Gallitzin in each direction and 80 helper engines have been required out of Conemaugh.

The westbound movement out of Altoona and Hollidaysburg to Gallitzin exceeds the eastbound movement in number of cars, but empty cars make up a much larger proportion of the total and the tonnage is therefore less. In order to keep the number of train movements approximately balanced, the tonnage out of Altoona is fixed at 3,020 adjusted tons which requires an I1s locomotive with two class L1s helpers.

Most of the empty coal and coke cars are handled westward through Hollidaysburg and over the New Portage railroad to the summit at Gallitzin. Over this route the class I1s locomotive with two class L1s helpers has a rating of 3,590 adjusted tons. Trains of empty all-steel cars are limited to 115 cars, mixed steel and wood equipment empty to 90 cars and loads to 75 cars. Since the eastbound movement of locomotives into Altoona exceeds the number coming westward out of that point, and the reverse is true of Hollidaysburg, it is necessary to run some locomotives and



Map of Pennsylvania System Tracks in and About Pittsburgh

crews light from East Altoona to pick up trains at Hollidaysburg, 10.4 miles distant. From Gallitzin to Derry no helpers are required, but from Derry helpers are sometimes used, working them back to Pitcairn with the train.

In addition to the main line runs, there are numerous trains operating in and out of yards on the branch lines, such as Youngwood. The most important of these are shown in the list of tonnage ratings, Table II. Because of the operating conditions in this territory, overloaded freight trains reduce the capacity of the line and rating is adjusted to enable the trains to make a fair speed over the division. The loading shown is not the maximum that the locomotive can haul

TABLE II—TONNAGE RATING OF SLOW FREIGHT TRAINS

	Adjustment factor	Rating adjusted tons I1s	L1s
Eastward—			
From Pittsburgh, Pitcairn or Youngwood to Derry, and from Conemaugh to Gallitzin...	4	2,020	1,605
From Derry or Blairsville to Conemaugh.....	16	4,755	3,805
From Pittsburgh and Allegheny for Conemaugh division points.....	15	5,875	4,700
From Conway, Pittsburgh, Butler Junction and Blairsville to Conemaugh or Gallitzin (helpers required east of Conemaugh).....	16	4,755	3,805
From Shire Oaks to Pitcairn.....	20	6,000	5,000
Westward—			
From Hollidaysburg to Gallitzin.....	4	1,400	1,095
From Altoona to Gallitzin.....	4	1,180	920
From Gallitzin to Derry.....	6	4,365	3,465
From Derry to Pitcairn, Pittsburgh or "VI" on the Brilliant Branch.....	5	2,450	1,945
From Conemaugh to Allegheny or Conway...	10	5,065	4,050
From Pitcairn to Thomson.....	24	6,250	5,000
Northward—			
From Youngwood to Radebaugh, via Radebaugh Junction	4	1,880	1,480
From Pittsburgh to Canton.....	5	2,970	2,100
From Canton to Pittsburgh.....	5	2,900	2,200
From Crestline to Canton.....	5	2,970	2,260
From Canton to Crestline.....	5	3,230	2,500

and is sometimes exceeded, as between Derry and Conemaugh.

Freight Traffic Diverted From Main Line Through Pittsburgh

Because of the difficult operating conditions in and about Pittsburgh, alternate routes have been developed to take freight traffic off the main line and keep it out of the section where it would interfere with local passenger service. There is a heavy movement from Conway yard, located west of Pittsburgh, to Conemaugh, including 300 cars of ore daily. This moves through Allegheny (Pittsburgh north side) up the north bank of the Allegheny river to Butler Junction and thence across the Allegheny river at Kiskiminetas Junction, continuing over the Conemaugh division to Conpitt Junction. Over this line one I1s locomotive can haul 5,000 adjusted tons to Conemaugh. If the train goes east of Conemaugh, two helpers are added.

Very little of the freight moving westward passes over the main line between East Pittsburgh and Pittsburgh. Slow freight for the Ft. Wayne route leaves the main line at Turtle Creek, passing to the Port Perry branch, across the Monongahela river and through the tunnel to Thomson. From Thomson it moves over the Monongahela river line to the Ohio connecting bridge, crossing the Ohio river and joining the Ft. Wayne line at Jacks Run. Some of the bridges on the Monongahela line are not designed to carry locomotives as heavy as the I1s and for that reason it will not be possible to use them over this route until the reconstruction of the bridges now under way is completed. Preference freight is routed over the main line to C M tower east of East Liberty station where it is diverted to the Brilliant branch, moving across the Allegheny river to Sharpsburg and over the Conemaugh division to the junction with the Ft. Wayne tracks at Federal street, northside, Pittsburgh. This is the present route for all I1s locomotives between Pitcairn and points west of Pittsburgh.

Freight for the Panhandle follows the same route as slow freight for the Ft. Wayne to Thomson, passing over the Monongahela river line to its connection with the Panhandle division at D U tower, west of Smithsfield street station, Pittsburgh. Decapod locomotives are not used on the Panhandle division at present. Cars destined for points on the River branch of the Monongahela division go to Thomson and then directly south over the Monongahela division. Class I1s locomotives are used on this line as far south as Brownsville.

In addition to their use between Pitcairn and Altoona and around Pittsburgh, the I1s locomotives are being operated between Pittsburgh and Canton and between Canton and Crestline. These districts have moderately heavy grades. The maximum grade between Pittsburgh and Canton westbound is 0.89 per cent, and the maximum rating of the Decapod type is 2,770 adjusted tons. Eastbound the ruling grade is 0.80 per cent with a short maximum of 0.91 per cent, and the rating is 2,900 adjusted tons. From Canton to Crestline, where there are grades of 0.87 per cent, the locomotives haul 3,230 adjusted tons. Eastbound there are long grades of 0.87 per cent, with a short maximum of 0.97 per cent and the rating is 2,970 adjusted tons.

It is expected that the majority of the class I1S locomotives will be assigned to the territory between Altoona and Crestline, and between Pittsburgh and the lake ports.

Comparative Cost of Operation With Mikados and Decapods

While the primary consideration in the development of the I1S locomotive was the increased capacity of the line that could be obtained with heavier trains, the effect on operating costs was also given thorough study. While no direct comparison of the operating expenses when using I1s Decapod and L1s Mikado locomotives is available, the data regarding the individual items on the Pittsburgh division, where the Decapod has been used most extensively, indicate decreases in the major items of expense on a ton-mile basis in practically every case. From the tonnage ratings for the two classes it will be noted that the Decapod hauls from 20 per cent to 41 per cent more tonnage than the Mikado. The speed is practically the same, the advantage, if any, being in favor of the Decapod. The best comparison that has been made in heavy freight service shows the coal consumption per mile for the I1s as built in 1918 was about 14 per cent greater than for the Mikado when hauling 27 per cent greater tonnage, giving a decrease in coal per ton-mile of 10 per cent. From observation, it is evident that the new design with the feedwater heater is considerably more economical in the use of fuel, but no tests have yet been made to determine the amount of saving.

Since the charges for repairs are not allocated to individual classes of locomotives, any comparison of the costs would necessarily be only estimated. In general, it may be said that no special difficulty is experienced in maintenance. Crossheads and rod bearings required periodical attention, and changes have been made to reduce wear and to facilitate repairs.

Pennsylvania Stands Ground Against Labor Board

THE PENNSYLVANIA definitely announced to the Railroad Labor Board, following an all-day conference on April 27 between representatives of the road and of the board, that it intends to hold strictly to the conviction that it has a lawful right under the terms of the Transportation Act, to establish rules and working conditions with its employees and to observe contracts entered into by the road with its workers. E. T. Whiter, vice-president of the Northwestern region of the Pennsylvania and E. H. Seneff, general solicitor, represented the Pennsylvania, and B. W. Hooper, chairman of the Labor Board, A. O. Wharton, representative of the labor group, and J. H. Elliott, representative of the railroad group were present at the conference for the Labor Board.

The meeting was arranged to discuss the observance of the decision handed down by the Supreme Court on February 19, sustaining the Labor Board in the case brought by the road challenging the Board's jurisdiction in the matter of wages of railroad workers and their employment conditions. In view of developments at the conference, it is understood that the Board will now proceed within a few days to publish officially its decision, censuring the Pennsylvania for its conduct in the case in question. The Pennsylvania will probably ignore this action.

The carrier's spokesmen held that in view of the expressed desires of the duly elected representatives of the shopcraft employees, it had no choice in the matter except to be governed by the employees' decision. They upheld the stand of the road on the ground that since the Board's decision, the shop employees themselves have clearly indicated their approval of the elections already held by a majority of the men remaining at work when the shopmen's strike was called last July. Subsequent elections, it was said, resulted in a large majority for the continuation of the plan, two-thirds of the men who remained at work having repudiated System Federation No. 90, the shopcraft union which called the strike. Further defense of the Pennsylvania's action was based on the fact that on April 6, 1922, the whole subject of the Pennsylvania's controversy with the Labor Board was taken up by the management with 775 elected employee representatives

of the shopmen, and that they unanimously voted that the present plan of employee representative be continued in effect. It was further held that the Supreme Court, in its recent decision, in effect approves the procedure which the Pennsylvania has taken in establishing a successful means of dealing with its employees, and eliminating the causes of strike and interruptions to transportation. It was claimed that the Pennsylvania plan proved so successful during the severe test of the shopmen's strike, that the company's service was never seriously interfered with and that it actually carried more freight than ordinarily.

A letter from Samuel Rea, president of the Pennsylvania, reviewing the conditions at the time of the beginning of the strike last summer and the changes which have taken place since that time, was read at the conference. In conclusion Mr. Rea wrote: "Having submitted the question at issue to the duly elected representatives of the shopcraft employees for their decision and determination, in view of our repeated assertions that we propose to let our employees have a voice in determining the rules and regulations under which they should work, and having obtained from them a unanimous expression that they desire that we continue with the present plan of employee representation without submitting to a vote questions of choice as between representation by System Federation No. 90, and representation by the committee, as now constituted and elected by employees themselves, we have no choice in the matter except to be governed by the express wishes of our employees."

Commenting upon the stand taken by the Pennsylvania, Chairman Hooper of the Labor Board, declared that from the standpoint of the public, "the attitude of the carrier's management is extremely regrettable. In this case," he said, "it became necessary to negotiate a new agreement as to rules and working conditions for the shopcrafts. The railroads decline to concede that the federated shopcrafts represented a majority of this class of employees and have the right to negotiate the agreement. To test this question it was agreed that an election be held, but the parties disagreed as to the methods of holding it. This resulted in two elections, one held by the management and one by the employees' organization. In the management election, only 3,480 men voted for the company's committee out of a total eligible vote of 33,104. The dispute then came to the Labor Board, which decided that for certain reasons neither election was regular, and ordered a new one. The railroad refused to abide by this decision of the Board on the grounds that the Board had no jurisdiction to render such a decision."

The decision of the Supreme Court, upholding the Labor Board, was reported in the *Railway Age* of February 24, page 479.

Freight Car Loading

WASHINGTON, D. C.

THE loading of revenue freight in the week ended April 21 continued to exceed all records for this season of the year. The total, 957,743 cars, was 10,984 cars more than were loaded during the previous week and 251,606, or 35.6 per cent, greater than that for the corresponding week of last year. This also represents the sixth consecutive week in which the loading has exceeded the estimate reported by the Car Service Division to the American Railway Association at its meeting in New York early in April. The loading of forest products, 80,140 cars, exceeded all previous records for a week and the loading of several other classes of commodities broke previous records for the season. Coal loading showed an increase of 116,398 cars as compared with the corresponding week of last year when there was a coal strike, but there was also an increase of 82,069 cars in miscellaneous freight, of which 351,966 cars were loaded.

The car shortage continued to decrease during the period from April 15-23, when the average was 44,299, including 20,725 coal cars and 19,349 box cars. There were also surpluses amounting to 11,062 cars.

Freight cars in need of repair on April 15 totaled 214,051 or 9.4 per cent of the cars on line, according to reports filed with the Car Service Division. This was an increase of 7,739 cars compared with the total on April 1, at which time there were 206,312 or 9 per cent. Of the total 157,409 cars, or 6.9 per cent were in need of heavy repair. This was an increase of 3,107 since April 1. Reports also showed 56,642 cars or 2½ per cent in need of light repairs, an increase of 4,632 since April 1.

A SPECIAL MENU for children is the latest innovation on the dining cars of the Northern Pacific. It is illustrated with pictures designed to interest children.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, APRIL 21, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded	Corresponding period	
										1923	1922	1921
Eastern	1923	6,440	2,927	56,133	4,369	6,348	3,944	63,926	98,066	242,153	.....	.....
	1922	6,729	2,786	6,309	1,170	4,734	1,100	67,179	73,993	.....	164,000	174,499
Allegheny	1923	2,154	2,667	54,065	7,474	3,920	6,679	48,384	87,965	213,308	.....	.....
	1922	1,892	2,298	11,434	4,083	2,674	2,368	50,411	62,030	.....	137,190	141,840
Pocahontas	1923	242	83	23,906	602	1,967	196	6,321	5,638	38,955	.....	.....
	1922	186	92	22,594	243	1,183	30	6,043	4,083	.....	34,454	28,142
Southern	1923	3,838	2,008	21,131	1,445	24,783	1,890	40,165	46,056	141,316	.....	.....
	1922	2,807	2,017	15,614	514	18,061	685	37,451	40,930	.....	118,079	111,331
Northwestern	1923	10,313	8,995	4,708	1,481	23,686	3,551	29,886	39,252	121,872	.....	.....
	1922	8,484	6,716	2,776	1,273	16,378	3,146	29,388	28,814	.....	96,975	87,831
Central Western	1923	10,704	13,937	15,764	496	10,609	3,131	35,142	52,094	141,877	.....	.....
	1922	9,522	10,934	3,424	170	5,972	1,691	34,232	39,847	.....	105,792	103,523
Southwestern	1923	4,434	2,700	4,055	143	8,827	512	14,696	22,895	58,262	.....	.....
	1922	3,458	3,125	1,213	147	6,512	608	14,384	20,200	.....	49,647	57,466
Total West. districts	1923	25,451	25,632	24,527	2,120	43,122	7,194	79,724	114,241	322,011	.....	.....
	1922	21,464	20,775	7,413	1,590	28,862	5,445	78,004	88,861	.....	252,414	248,820
Total, all roads	1923	38,125	33,317	179,762	16,010	80,140	19,903	238,520	351,966	957,743	.....	.....
	1922	33,078	27,968	63,364	7,600	55,514	9,628	239,088	269,897	.....	706,137	.....
	1921	32,671	29,732	138,389	4,682	47,167	5,838	213,388	232,765	.....	.....	704,632
Increase compared	1922	5,047	5,349	116,398	8,410	24,626	10,275	.....	82,069	251,606	.....	.....
Decrease compared	1922	.....	.....	.....	.....	.....	.....	568	.....	.....	.....	.....
Increase compared	1921	5,454	3,585	41,373	11,328	32,973	14,065	25,132	119,201	253,111	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April 21	1923	38,125	33,317	179,762	16,010	80,140	19,903	238,520	351,966	957,743	706,137	704,632
April 14	1923	39,329	30,319	182,356	16,014	77,313	18,296	238,636	344,496	946,759	700,155	702,116
April 7	1923	39,353	30,883	164,089	16,076	73,957	15,381	234,208	321,820	895,767	706,013	694,881
March 31	1923	41,842	31,726	182,668	16,740	76,124	15,435	235,695	339,495	938,725	821,808	663,171
March 24	1923	39,383	30,349	185,062	14,839	73,384	14,700	232,639	326,680	917,036	837,241	686,567

Alfred Answers Couzens' Criticisms of Railroads

Cites Increase in Ton Miles Per Train—Effect of Labor Legislation and Locomotive Inspection

FRANK H. ALFRED, president of the Pere Marquette, has written a letter to Senator James Couzens replying to charges of inefficiency made by the latter against railway management in a previous communication to Mr. Alfred. Mr. Alfred in his reply has quoted from Senator Couzen's letter sufficiently to make clear the Senator's views as expressed therein, which follow rather closely the opinions he expressed in a letter to Julius Kruttschnitt which was published in full in the *Railway Age* of April 21.

Senator Couzens in his letter to Mr. Alfred, as in the letter to Mr. Kruttschnitt, evidently based his criticism on an article which appeared in the *Railway Age* of February 11, 1921, entitled "Are Modern Locomotives Efficiently Used?" Mr. Alfred challenges his citing only the decrease in freight train miles per locomotive and the fact that ton miles per 1,000 lb. of tractive effort have not increased. A criticism based on these points alone is not fair, Mr. Alfred contends, in that no mention is made of the 107 per cent increase in net ton miles per train and the handling of 74 per cent more traffic with an increase of but 21 per cent in freight train miles. These points also were brought out in the article mentioned and testify to an increase in efficiency.

Bearing on the matter of attempting to prove a point by the quotation of portions of the *Railway Age* article, Mr. Alfred observes:

"It has frequently been stated that anything can be proven or disproven by the Bible, that is, if you undertake to base your conclusion upon a part truth or upon one truth without its relationship that goes to form the whole."

Mr. Alfred's letter follows in part:

Mr. Alfred's Letter

At the outset, the government started out to regulate the railroads, which in the interests of society it was quite proper to do, if there was discrimination in the case of one community which operated to the disadvantage of another, but when the representatives of the people fail to realize that point where proper regulations end and oppression and confiscation begin—and this is occurring every day in our state and national councils—it is time for the railroads to place the blame where it belongs.

After devoting nearly one-half of your letter in reply to mine by quoting from the issue of the *Railway Age* of February 11, 1921 (over two years old), the very first expression from your own pen is misleading.

By way of divergence for a moment, it has been frequently stated that anything can be proven or disproven by the Bible, that is, if you undertake to base your conclusion upon a part truth or upon one truth without its relationship that goes to form the whole.

I hold no brief for the *Railway Age*, but I believe that you have accepted as an axiom what it merely states as the passing impression of one writer who does not pretend to take into consideration all the factors that enter in the equation. Furthermore, you fail to consider the article as a whole.

I repeat your statement: "If you will refer to those statistics which are based on compilations made by the Interstate Commerce Commission, the Bureau of Railway Economics, which, I understand, is supported by the railroads, and the American Railway Association, Car Service Division, also maintained by the railroads, you will see that they completely corroborate my assertions that during the period 1903 to 1920, freight train miles per locomotive have decreased 20 per cent, and that there has been no gain in ton miles per thousand pounds of tractive effort during the same period."

Says Railway Age Figures Prove Increased Efficiency

The table showing the efficiency of utilization of locomotives is set up seriatim, one year with another, from 1902 to 1920. In the next *column, beyond the one you refer to as showing a decrease in revenue freight train miles per locomotive, per year, you must have noted that while there was a decrease, as you state, of* 20 *per cent in the train miles run, there was an increase of* 107 *per cent in the net ton miles per train. You must also have noted this statement in the article:* "This increase in the number and capacity of locomotives made it possible to handle 74 per cent more traffic with an increase of only 21 per cent in the number of freight train miles."

The measure of efficiency and economy in railroad operation is the number of revenue ton miles hauled per revenue train miles run. From 1902 to 1920, according to the *Railway Age* article which you quote, this has been increased 107 per cent and must be accepted as a measure of increasing efficiency of railroad operation for the period in question.

The same statistics show that during the eleven year period, 1903 to 1913 inclusive, there was an increase in the net ton miles of revenue freight handled by all railroads of 74 per cent. In the eight years, 1913 to 1920 inclusive, the increase was only 40 per cent. As a matter of fact, the net ton miles of revenue freight for the years 1914 to 1915 were less then they were for 1913. Without relying too much on statistics, the railroads provided themselves with locomotives to take care of a business that did not come up to expectations.

Should Have Elicited Criticism

The *Railway Age* article, to which you refer, is an unfortunate one and should have elicited criticism at the time it was published. I have no recollection of reading a reply to it and assume it was at least not fully answered. You will note the article does not pretend to give an answer. It says: "Freight train miles per locomotive have decreased 18 per cent since 1903. Does not this represent a loss of over two months' service a year for each freight locomotive, or an investment in idle locomotives of from $100,000,000 to $200,000,000?"

You have merely taken one phase, which set off by itself, might indicate lack of efficiency. Now it is necessary for a railroad to function properly to provide itself with sufficient locomotives to handle its business in peak load periods without delay or congestion. This would result in a surplus of locomotives during periods of business recession with the result that a proportion of them would be idle. These peak load periods are both seasonal and periodical. For instance, we have in Michigan—as in the West and South—a tremendous fruit crop to handle and this must be done in a very brief interval. Accordingly, we must have reserve power in order to handle this business when it comes. The successful railroad manager gages his system to this idea. If there

were no seasonal movements and cycles of exceptional general prosperity of this nature, the flow of traffic being equal the year round, the transportation problem of the United States would be comparatively easy of solution. I do not intend to claim that the railroads have been in a position to carry a surplus of power, but *I do claim* that they should be commended—not criticized—for doing this.

The Volume of Traffic at the Peak and in Depression

I might call your attention to two very important things that have happened which in a measure destroy the comparative value of statistics over this period when used for the purpose of determining efficiency. Those two things are, first, the Adamson Law plus the general national agreements that have become standardized during the past few years and, second, government inspection of locomotives.

Railroad management has accepted the eight-hour or 100-miles a day and during recent years the distance between terminals has been reduced whenever practicable, the aim being to get the train over the road as nearly as possible on a 12½ mile per hour schedule. For freight trains that do not average 12½ miles per hour, the company is penalized in that overtime at the rate of time and one-half is paid. This has a very great effect on the time locomotives are on the road as compared with previous years.

Under the rules of the Interstate Commerce Commission for inspecting locomotives, it is necessary at many terminals to hold locomotives out of service once a month, sometimes in excess of 24 hours to complete the test. The effect of this is a reduced use of power.

Railroads are today in the market for a very large number of locomotives for the movement of an anticipated increasing volume of traffic. If the traffic does not increase in the amount expected, the railroads should not be punished as false prophets. On the other hand, I am sure that if the business does increase and the railroads are able to handle it, their action in anticipating its needs will be commended by the public.

In a following paragraph, you ridicule a statement made by me that there is a difference between a captain of industry and a railroad manager. I mean to convey exactly what you say does not exist: *That there is one rule for railroads and another for industrial enterprise.* Railroads cannot be successfully managed if they are to be subject to the passing whims and fancies of a constantly changing group of politicians. You cannot run a railroad according to every street corner theory. That cannot be done in industry. "The captain of industry has to face the realities of proper management and sound finance," as you state. The railroad general manager has to face both of these and, in addition, political interference. Therein lies the difference. You say that there is not one rule for the railroads and another for industrial undertakings. *That is exactly what there is.* The hand of the government does not extend into every department of a business enterprise. That is exactly what the government does in the case of the railroads, as everybody knows.

The Volume of Traffic at the Peak and in Depression

You say: "You lay too much stress upon the necessity imposed upon you of operating your railroad in periods of depression, yet during the depression of 1921, railroad traffic was only 25 per cent less than in 1920, and in 1922, the traffic carried was 19 per cent less than in 1920 and the working forces were also reduced 19 per cent exactly in proportion to decreasing traffic handled."

Railroads, as a whole, earn annually, a gross of say only 30 per cent of the capital investment. Interest on outstanding obligations and taxes are the same even though the gross earnings fall off 25 per cent, so that the loss of 25 per cent in gross earnings may spell receivership to a railroad. General managers of railroads hold the percentages in greater respect, naturally, than captains of industry of the psycho-analyst school of economics.

The A. R. A. Goal of Efficiency

You say: "Statements issued by the American Railway Association on the fifth indicate very clearly that there is room for more efficient and competent management, particularly when it says that by October 1, 1923, they are going to be more efficient." What possible objections or criticisms can there be to railroad executives setting a goal in efficiency and operation which they hope to reach by October 1, next?

If you will examine the reports you refer to, you will note on the chart a red line denoting traffic forecast for 1923 and that it is expected that the peak load in operation will be reached in October. The railroads' executives have prepared a program contemplating the necessary additional facilities to take care of this volume of business expected to be the largest ever handled by the railroads. This is the way the railroad executives have of keeping all of the railroad managers informed and it means co-operation on the part of all railroads to place themselves in position to provide the public with the maximum service. You will note that it requires co-operation on the part of the public to carry out the program. For example, the railroad management is not responsible for the capacity loading of cars. That is a matter for the shipper. All the railroad officers can do is to urge upon the shipper that he load the cars more heavily.

Rail Production in 1922

THE PRODUCTION of rails in the United States showed a continued decline during 1922 according to the statistics of the American Iron & Steel Institute. A total of 2,171,776 gross tons were produced in 1922 as against 2,178,818 gross tons for 1921. This is the lowest tonnage produced since 1908 with the exception of 1914 when there was a total of 1,945,095. The amount of Bessemer rail decreased until it formed only 1.03 per cent of the total production as against 2.55 per cent in 1921 and 5.49 per cent in 1920.

PRODUCTION OF RAILS BY PROCESSES, GROSS TONS, 1908-1922

Years	Open-hearth	Bessemer	Rerolled*	Electric	Iron	Total
1908	571,791	1,349,153	.....	.....	71	1,921,015
1909	1,256,674	1,767,171	.....	†	.....	3,023,845
1910	1,751,359	1,884,442	.....	†	230	3,636,031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	.....	3,327,915
1913	2,527,710	817,591	155,043	2,436	.....	3,502,780
1914	1,525,851	323,897	95,169	178	.....	1,945,095
1915	1,775,168	326,952	102,083	.....	.....	2,204,203
1916	2,269,600	440,092	144,826	.....	.....	2,854,518
1917	2,292,197	533,325	118,639	.....	.....	2,944,161
1918	1,945,443	494,193	101,256	.....	.....	2,540,892
1919	1,893,256	214,121	96,422	50	.....	2,203,843
1920	2,334,222	142,899	126,698	297	.....	2,604,116
1921	2,027,215	55,559	96,039	5	.....	2,178,818
1922	2,033,000	22,317	116,459	.....	.....	2,171,776

*Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails from 1908 to 1910 inclusive.

†Small tonnages rolled in 1909 and 1910, but included with Bessemer and open-hearth rails for these years.

PRODUCTION OF RAILS, SHOWING INCREASE OR DECREASE BY PROCESSES, GROSS TONS, 1921-1922

Kinds	1921	Per cent	1922	Per cent	Increase	Per cent
Open-hearth	2,027,215	93.04	2,033,000	93.61	5,785	.29
Bessemer	55,559	2.55	22,317	1.03	*33,242	*59.83
All other	96,044	4.41	116,459	5.36	20,415	21.26
Total	2,178,818	100.00	2,171,776	100.00	*7,042	*.32

*Decrease.

Girder and high T rails for electric and street railways are included in the figures given above. For recent years

the tonnage was as follows: 1917, 91,674; 1918, 20,834; 1919, 112,712; 1920, 100,910; 1921, 89,162; 1922, 128,878 gross tons.

The total production of rails as given above includes, in addition to new rails rolled, rails rerolled from defective rails and from old rails. The total of renewed or rerolled rails so included is given in gross tons below.

PRODUCTION OF RENEWED AND REROLLED RAILS, 1914-1922

Years	Rerolled from new seconds, new defective rails, etc.			Rolled from old rails	Total rerolled
	Open-hearth	Bessemer	Total		
1914	13,538	13,234	26,772	95,169	121,941
1915	6,477	2,652	9,129	102,083	111,212
1916	1,711	2,149	3,860	144,826	148,686
1917	1,825	7,182	9,007	118,639	127,646
1918	13,296	19,462	32,758	101,256	134,014
1919	1,933	5,766	7,699	96,422	104,121
1920	19,493	1,979	21,472	126,698	148,170
1921	6,525	702	7,227	96,039	103,266
1922	996	.....	996	116,459	117,455

The increasing use of heavy rail is indicated in the following table showing the production of rail by weight per yard. Production of sections of 100 lb. and over was 902,900 tons for 1922 and 849,566 tons for 1921 while the productions of sections of 85 lb. and less than 100 lb. was 728,604 lb. for 1922 and 902,748 lb. for 1921, the production of the heavier sections showing an increase while other suffered a decrease.

PRODUCTION OF RAILS BY WEIGHT PER YARD, 1906-1922

Years	Under 45 pounds	45 and less than 85	85 and less than 100	100 pounds and over	Total gross tons
1906	284,612	1,749,650	1,943,625		3,977,887
1907	295,838	1,569,985	1,767,831		3,633,654
1908	183,869	687,632	1,049,514		1,921,015
1909	255,726	1,024,856	1,743,263		3,023,845
1910	260,709	1,275,339	2,099,983		3,636,031
1911	218,758	1,067,696	1,536,336		2,822,790
1912	248,672	1,118,592	1,960,651		3,327,915
1913	*270,405	†967,313	2,265,062		3,502,780
1914	*238,423	†309,865	868,104	528,703	1,945,095
1915	*254,101	†518,291	742,816	688,995	2,204,203
1916	*295,535	†566,791	1,225,341	766,851	2,854,518
1917	*308,258	†882,673	989,704	763,526	2,944,161
1918	*395,124	†665,165	888,141	592,462	2,540,892
1919	*263,803	†495,577	965,571	478,892	2,203,843
1920	*489,043	†433,333	952,622	729,118	2,604,116
1921	*211,568	†214,936	902,748	849,566	2,178,818
1922	*265,541	†274,731	728,604	902,900	2,171,776

*Includes rails under 50 pounds.
†Includes 50 pounds and less than 85 pounds.

Safety Officers Hold Convention at St. Louis

Many Angles of Accident Prevention Work Discussed—Roads To Conduct a Second Crossing Campaign

THE ANNUAL MEETING of the safety section of the American Railway Association was held on April 25, 26 and 27 at the Statler Hotel, St. Louis, Mo., with an attendance of about 140. The meeting, the third held by this section, was marked by sustained interest and a display of much spirit. The vice-chairman, Isaiah Hale (A. T. & S. F.), presided, Chairman J. T. Broderick being unable to be present.

Crossing Accidents Increase

The report of the committee on preventing highway crossing accidents was presented by the chairman, H. A. Rowe (D. L. & W.). This report reviewed the experiences of 1922 and outlined the preparations made for undertaking the crossing campaign which is to be conducted this year. During June, July, August and September, 1922, there were 758 persons killed at crossings and 1,902 injured, as compared with 685 killed and 1,691 injured in the same period of the preceding year. The report further shows, however, that 61 of the 73 added deaths occurred in the month of June, "before the four-months campaign was making itself felt"; that during this period freight traffic, as indicated by car loadings, was greater by 11 per cent than for the same period of the preceding year and that in 1922, the manufacture and registration of automobiles and trucks had increased 17.6 per cent. On December 31, 1922, there was one car registered for every 8.7 persons in the country. These facts place the results of the careful crossing campaign in a better light, and also emphasize the necessity for continued action by the railroads.

No period has been fixed for the commencement or the termination of the crossing activities this year but there will be a vigorous drive during the months of June, July, August and September. Every railroad will be urged to look early and constantly to the condition of its crossings and to impress on its employees their responsibilities. The committee suggests: (1) the inspection of all grade crossings by the division superintendents, accompanied by a maintenance of safety officer; (2) the removal as far as practicable of embankments, shrubbery and other obstructions to view; (3) the exercise of special care in the maintenance of crossings and inspection of warning equipment; (4) the proper instruction or re-instruction of watchmen or gatemen as to the manner of giving signals; and (5) the early and certain correction of faults on the part of enginemen or trainmen when approaching crossings. Posters and other printed matter will be used, as before. Communication has already been had with influential national organizations, the automobile associations, Rotary and Kiwanis Clubs, the railway commissions, the Boy and Girl Scout organizations, etc., all of which have promised co-operation. The National Safety Council will distribute among the industries one per cent of each railroad's quota of literature on the campaign and will devote the May issue of the National Safety Bulletin to the subject. The Pathé, Kinogram, Fox and International News Services will feature the campaign in all their picture houses during the first week in June, and pictures of particularly interesting accidents occurring during the summer will be accepted. The automobile "blue-book" will make use of the slogan in connection with railroad crossing items in its pages and several other publishers of road maps will copy the poster.

R. H. Aishton Addresses the Section

Mr. Aishton complimented the association on its accomplishments. The section, he said in effect, should feel encouraged rather than discouraged with the results of last year's crossing campaign. In no previous year had there been such an extraordinary situation as in 1922, requiring many of the safety officers temporarily to abandon their accident prevention activities. In view of these facts, he contended the results obtained were very favorable. The section's work had helped to remove from the minds of legislators and the public much of the pessimism about railroads.

Referring to the fact that in every month of this year the railroads will have to carry record loadings, he expressed confidence that the safety officers would give a good account of themselves. Safety officers must constantly keep the managements and the public informed of their activities.

The presentation of the report on preventing crossing

accidents was followed by an extended discussion. F. W. Mitchell (N. Y., N. H. & H.), in a paper on whistle practice called attention to the inclination of many enginemen to whistle according to their fancy. Uniform and positive spacing of the whistle blasts is important. He urged thoughtful compliance with the rules on the use of whistles and went so far as to suggest installing a connection on the firemen's side for emergency use.

In support of the latter suggestion, J. L. Walsh (M. K. & T.), reported that his road not only had the whistle connection on the firemen's side, but a rule requiring enginemen to blow the whistle a second time, after passing the whistle post, if an automobile should be seen to continue approaching the track. R. C. Richards (C. & N. W.) reported that his road not only provided a fireman's connection and required the second whistle when vehicles were seen on the road, but requires also the prolonging of the whistling in such cases until the crossing is passed. This is also required of a train approaching a crossing on double track where another train is leaving the crossing. D. E. Satterfield (C. & O.), however, declared it an unnecessary burden on the enginemen to require the second whistling, believing it sufficient to follow rule 14-L, with the additional requirement that the whistle be held open until within 200 ft. or 300 ft. of the crossing. S. S. Morris (I. C.) objected to a whistle on the fireman's side on the ground of the danger likely to arise from the divided responsibility. Taking exception to a suggestion to concentrate attention on the more dangerous crossings, E. R. Cott, Hocking Valley, declared that all crossings should be considered equally important.

S. G. Watkins (B. & M.) laid emphasis on the importance of visual indications that really catch the eye of the highway traveler, remarking that "in parts of the country where hills and trees abound and especially where people are in closed cars, the engine bell and the whistle are of little use." He favors the painting of adjacent fences. The Boston & Maine as a supplementary measure, had reported to the registrar of vehicles the license number of cars approaching crossings at excessive speed or failing to respond to the watchman's signal.

E. M. Switzer (C. B. & Q.) read a paper on the watchman. There are 21,700 full time crossing watchmen and gatemen in railway service in this country. Special attention should be given to the mental and physical qualifications of all applicants, particularly in view of the fact that these persons are often aged or disabled in some way. In general Mr. Switzer recommends that an age limit of 55 years be adopted.

Papers were read on public school work, moving pictures, etc. These are fields for the prevention of accidents generally. Work among school children is especially well repaid by reason of the many individuals that can be reached. For use among school children and elsewhere the committee on publicity and education, of which Arthur Ridgway (D. & R. G. W.) is chairman, reported the purchase of several films as a nucleus for the association's film library. These films were exhibited during the session.

Statistical Report

The report of the committee on statistics, presented by T. H. Carrow (Penn.) gave figures compiled from Interstate Commerce Commission reports as follows:

DEATHS AND INJURIES, TWELVE MONTHS, 1921 AND 1922

	1921		1922		P. C. Increase	
	Killed	Injured	Killed	Injured	Killed	Injured
Train Accidents	358	4,065	415	4,922	15.9	21.1
Train Service Accidents	5,229	39,259	5,437	43,068	4.0	9.7
Non Train Accidents ..	409	77,361	474	86,884	15.9	12.3
Total	5,996	120,685	6,326	134,874	5.5	11.8
Crossing Accidents (included above)	1,705	4,868	1,810	5,383	6.2	10.5

In the last quarter of 1922 the number of persons of various classes killed was more than 40 per cent greater than the number killed during the last quarter of 1921 and of injured more than 15 per cent greater.

A Proposed Code of Safety Rules

A set of instructions and safety rules was presented by F. M. Metcalfe (N. P.), which was a compendium of safety rules in effect over the United States. This is intended to be used as a basis for action by the Committee of Direction in determining the feasibility of preparing safety rules covering all classes of work. The discussion disclosed the existence of widely divergent views on the value of such rules. The maintenance of way departments of many roads already have adequate rules while the mechanical departments have only a few rules separate from the operating rules, and these rules are not well defined. Some favored putting all rules in one pamphlet, but others thought that they should be kept separate; while still others looked with disfavor upon supplementing the train service rules by safety rules. The matter was referred to the Committee of Direction.

As the Union Pacific is credited with the best record of all class 1 roads last year in accident prevention work, having shown a decrease of 20 deaths and 118 persons injured, considerable interest was taken in a comprehensive paper presented by H. A. Adams, of that road, describing in detail the nature of the safety organization and its methods. The usual local and division committees head up in a central safety committee, consisting of the general manager as chairman, all the department heads and the chairmen of the employees' fraternal organizations. Each local committee is represented at the division meeting by a chairman. The general safety officer attends all division meetings. The local and division meetings are held at least once a month. Rivalry is aroused among the division organizations and prizes are awarded for proficiency. In 1922 about 3,700 suggestions of unsafe conditions were submitted, of which 2,874 were adopted, while of 861 suggestions of unsafe practices 721 were acted on.

Other Matters Discussed

The remainder of the session was taken up with a discussion of the detail causes of accidents reported in the annual statistical statement of the Interstate Commerce Commission under the heads of Train Service Accidents and Non Train Accidents. Of non train accidents, a noticeable proportion arise in connection with the use of hand cars and motor cars. The improper location of handles on the car, the running of cars too close together, the practice of the workmen running alongside of a car when starting it, failure of the foreman to inform himself about overdue trains, the careless loading of motor cars with tools and the operating of motor cars at excessive speeds were mentioned by J. B. Thomas (C. B. & Q.) as among the causes of such accidents. Various ways of reducing their number were discussed. The St. Louis-San Francisco maintains electric indicators at the side of the track at curves, operated by the track circuits of the block signal system, for the guidance of motor car drivers. The men in the track forces are educated in the most effective methods of removing cars from the track in cases of emergency, and occasional surprise tests are made to determine the thoroughness with which the men have been drilled.

Other discussions dealt with explosives and inflammables, the handling of electric current, etc. During 1922, 168,301 tons of commercial explosives and a large additional quantity of fireworks were transported by rail in the United States, at a total loss of but one man injured and $75 loss of property.

The following officers were elected: Chairman, Isaiah Hale, safety superintendent, Atchison, Topeka & Santa Fe, Topeka, Kan.; first vice-chairman, H. A. Adams, assistant to general manager, Union Pacific, Omaha, Neb.; second vice-chairman, Robert Scott, superintendent insurance and safety, Atlantic Coast Line, Wilmington, N. C.

Fuel Consumption of Oil Burning Locomotives*

Data Obtained on Southern Pacific Facilitate Comparison of Steam and Electric Motive Power

By A. H. Babcock
Electrical Engineer, Southern Pacific Railroad

PART II

It will be of interest to follow a train from Kern Junction to Summit. All freight trains stop at Kern Junction to check the register, and for orders. The grade from Kern Junction to Magunden being light, the acceleration is high, and the speed at Magunden averaged about 38 miles per hour. According to the curve the fuel consumption per 1,000 ton-miles on a 0.1 per cent grade at constant speed would be 10.25 gallons. The actual fuel consumption as shown by "A" is 16.29 gallons. The difference (16.29 — 10.25 = 6.04) represents the fuel cost of acceleration. The grade from Magunden to Edison is 0.83 per cent. The speed of the train was reduced from about 38 miles to 30 miles per hour. According to the curve the fuel consumption

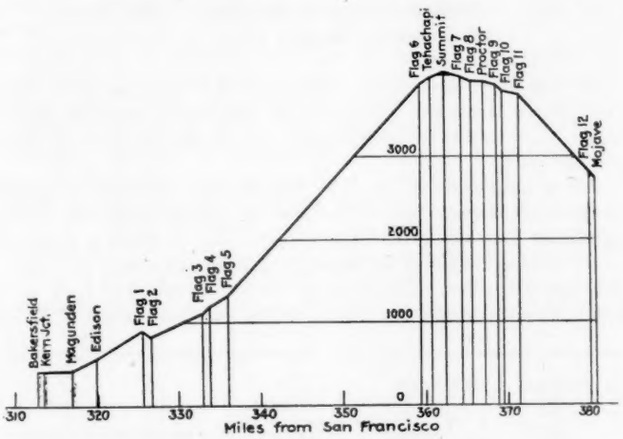


Fig. 3—Profile Map, Bakersfield to Mojave

This illustration was repeated from Part I for sake of convenience

should be 20.75 gallons, but the actual fuel consumption is 16.43 gallons. The difference (20.75 — 16.43 = 4.32) represents the fuel saved by using a part of the kinetic energy in the train. From Edison to Flag No. 1 the grade is increased to 1.16 per cent, the speed of the train is reduced to about 26 miles per hour, and point "C" is at the left of the curve. From Flag No. 1 to Flag No. 2 the grade is—1.22 per cent, the speed of the train is increased to 38 miles per hour, the kinetic energy is increased, and point "D" is at the right of the curve. From Flag No. 2 to Flag No. 3 the grade is 0.89 per cent, the speed is reduced to 31 miles per hour, and point "E" is at the left of the curve. From Flag No. 3 to Flag No. 4 the grade is 2.21 per cent, the speed is reduced to 17 miles per hour, and point "F" is at the left of the curve. From Flag No. 4 to Flag No. 5 the grade is 1.14 per cent, the speed is increased to 20 miles per hour, and point "G" is at the right of the curve. From Flag No. 5 to Flag No. 6 the grade is 2.31 per cent, the distance is over 23 miles, the drop in speed from 20 to 12 miles per hour has very little effect on the total fuel burned, and point "H" is on the curve. From Flag No. 6 to Tehachapi, the grade is 1.24 per cent, and although the train accelerated after passing Flag No. 6, which would tend to increase the fuel consumption, the train was brought to rest at Tehachapi and the kinetic energy in the train offset a part of the fuel that would have been burned at constant speed, and point "I" falls to the left of the curve. From Tehachapi to Summit the grade is 0.62 per cent. The train started from rest, therefore due to acceleration point "J" falls to the right of the curve. It is of interest to note that the actual test data illustrate the well known fact that kinetic energy can be exchanged for fuel and fuel for kinetic energy.

It is not considered that the results of this test should be depended upon for slight grades either positive or negative, because there is no section of level track between Bakersfield and Mojave. For grades of less than 0.5 per cent, both positive and negative, the curve should not be depended upon for accurate results.

A locomotive of lower thermal efficiency than the No. 3614 would burn more fuel for any given grade than that shown on the curve. The result would be a flatter curve. On the other hand a locomotive of higher thermal efficiency would burn less fuel than shown and the curve would be steeper. It is, therefore, apparent that the slope of the curve is a function of the efficiency, and the steeper the curve the higher the efficiency.

Fuel Required

From the curve, the fuel required per 1,000 ton-miles on a 2 per cent grade equals 38.0 gallons, and for a 1 per cent grade equals 23.3 gallons. The difference (38.0 — 23.3 = 14.7) represents the fuel burned moving a 1,000 ton train one mile over a 1 per cent grade without friction; because both the 38.0 and the 23.3 gallons are for grade resistance plus train friction, the train friction being the same in each case, the difference is for a differential grade resistance of 1 per cent. A 1 per cent grade resistance is 20 pounds per ton. Then the work done in moving the given train one mile over a 1 per cent grade without friction equals $20 \times 1{,}000 \times 5{,}280 = 105{,}600{,}000$ foot pounds. This required 14.7 gallons of fuel or $14.7 \times 8 \times 18{,}000 \times 778.1 = 1{,}647{,}082{,}080$ foot pounds. The thermal efficiency equals $105{,}600{,}000/1{,}647{,}082{,}080 = 0.0641$, or 6.41 per cent. It will be seen at once that this method of determining engine thermal efficiency is independent of train resistance at driver tires which, at best, is difficult to determine accurately.

The method used above for determining efficiency is based on a known weight of train, a known grade resistance and test values for fuel consumption, and should be very nearly correct.

The fuel burned on a 1 per cent grade for grade and train resistance is 23.3 gallons. If the train resistance equals X then:

$$(20 + X)/X = 23.3/(23.3 - 14.7)$$

From which X equals 11.7 pounds per ton.

This does not check with the assumed 7 pounds per ton,

*A paper presented at the spring convention of the American Institute of Electrical Engineers at Pittsburgh, Pa., on April 25. This is the second part of an article in two parts. The first part described a method employed for securing an accurate measurement of the efficiency of an oil-burning steam locomotive in moving a 1,000-ton train over a given piece of track. The following describes the manner in which the method was applied and includes the results obtained.

shown in Table V, because the 7 pounds covers only rolling friction, and the 11.7 pounds is for rolling friction plus locomotive internal friction, such as pistons, valves, and other engine parts. If Schmidt's 7 pounds is correct for the rolling friction then the difference, (11.7 — 7), 4.7, is the locomotive internal friction; this friction for the given train of 1,000 tons is equal to a drawbar pull of 4.7 × 1,000 = 4,700 pounds, or about 9.0 per cent of the total drawbar pull on the maximum grade of 2.31 per cent from Flag No. 5 to Flag No. 6.

As the negative grade increases, the fuel consumption is reduced until the negative grade resistance is numerically equal to the total frictional resistance of train and engine. The minimum fuel consumption of 2.5 gallons per mile as shown on the curve represents standby losses and should be about equal to the fuel burned standing on a siding with the train, which is 42.8 gallons per hour. Then 42.8/2.5 = 17.1

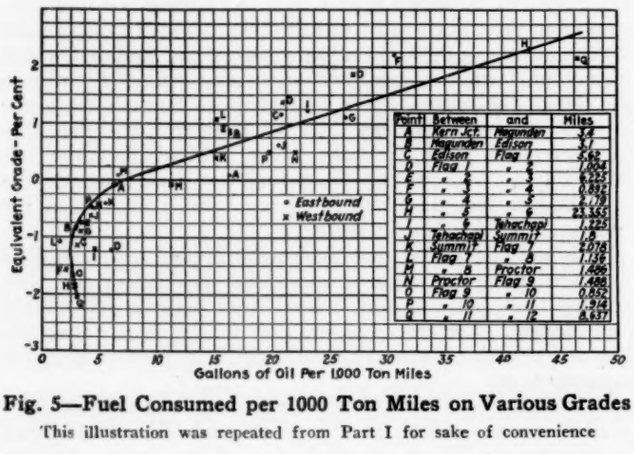


Fig. 5—Fuel Consumed per 1000 Ton Miles on Various Grades

This illustration was repeated from Part I for sake of convenience

is the drifting speed of the train in miles per hour, that corresponds to the minimum consumption of fuel. The down grade speed limit for freight trains by order is 18 miles per hour. Evidently, then, there is a good compliance with orders.

For heavy negative grades the fuel consumption is again increased, for pumping air for braking purposes.

The over-all efficiency determined by this test was 5.57 per cent. It is the ratio of the integrated foot pounds of

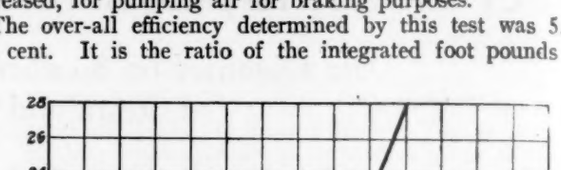


Fig. 6—Fuel Required to Accelerate 1000 Tons

Over-all thermal efficiency = 5.65 per cent

work done by the engine whenever the drawbar pull was positive, to the total energy in the fuel used over the same time. Apparently it is constant for all grades greater than 0.5 per cent.

For a long time it has been known that drifting as much as possible saves fuel. Except on positive grades only, seldom is it possible to drift to rest. Fig. 6 gives a measure of the saving that may be made by taking advantage of favorable opportunities. The kinetic energy, in terms of fuel, in a 1,000 ton train moving at 50 miles per hour equals 27.74

TABLE III—GRADE AND CURVATURE—TEHACHAPI

Location From	To	Distance miles	Rise feet	Total curvature degrees	Average grade per cent	Average curvature degrees	Per cent grade correction for curvature*	Equivalent grade per cent
EASTBOUND								
Kern Jct.	Magunden	3.4	17.8	.....	0.10	....	....	0.10
Magunden	Edison	3.1	135.7	.....	0.83	....	....	0.83
Edison	Flag 1	5.62	342.9	17.5	1.16	0.06	....	1.16
Flag 1	Flag 2	1.004	—68.9	99.3	—1.30	1.9	0.08	—1.22
Flag 2	Flag 3	6.225	268.9	589.5	0.82	1.8	0.07	0.89
Flag 3	Flag 4	0.892	89.0	376.3	1.89	8.0	0.32	2.21
Flag 4	Flag 5	2.179	115.0	417.5	1.00	3.6	0.14	1.14
Flag 5	Flag 6	23.355	2,575.0	6,751.0	2.09	5.48	0.22	2.31
Flag 6	Tehachapi	1.225	79.5	17.6	1.23	0.3	0.01	1.24
Tehachapi	Summit	1.8	58.5	.....	0.62	....	....	0.62
Summit	Flag 7	2.078	—46.0	.....	—0.42	....	....	—0.42
Flag 7	Flag 8	1.136	—65.0	13.6	—1.08	0.2	0.01	—1.07
Flag 8	Proctor	1.486	5.5	46.4	0.07	0.6	0.02	0.09
Proctor	Flag 9	1.488	—39.5	.....	—0.50	....	....	—0.50
Flag 9	Flag 10	0.852	—80.0	98.3	—1.78	2.2	0.09	—1.69
Flag 10	Flag 11	1.914	—50.0	27.9	—0.50	0.3	0.01	—0.49
Flag 11	Flag 12	8.637	—960.00	547.7	—2.10	1.2	0.05	—2.05
WESTBOUND								
Flag 12	Flag 11	8.637	960.0	547.7	2.10	1.2	0.05	2.15
Flag 11	Flag 10	1.914	50.0	27.9	0.50	0.3	0.01	0.15
Flag 10	Flag 9	0.852	80.0	98.3	1.78	2.2	0.09	1.87
Flag 9	Proctor	1.488	39.5	.....	0.50	....	....	0.50
Proctor	Flag 8	1.486	—5.5	46.4	—0.07	0.6	0.02	—0.05
Flag 8	Flag 7	1.136	65.0	13.6	1.08	0.2	0.01	1.09
Flag 7	Summit	2.078	46.0	.....	0.42	....	....	0.42
Summit	Tehachapi	1.8	—58.5	.....	—0.62	....	....	—0.62
Tehachapi	Flag 6	1.225	—79.5	17.5	—1.23	0.3	0.01	—1.22
Flag 6	Flag 5	23.355	—2,575.0	6,751.0	—2.09	5.48	0.22	—1.87
Flag 5	Flag 4	2.179	—115.00	417.5	—1.00	3.6	0.14	—0.86
Flag 4	Flag 3	0.892	—89.0	376.3	—1.89	8.0	0.32	—1.57
Flag 3	Flag 2	6.225	—268.9	589.5	—0.82	1.8	0.07	—0.75
Flag 2	Flag 1	1.004	68.9	99.3	1.30	1.9	0.08	1.38
Flag 1	Edison	5.62	—342.9	17.5	—1.16	0.06	....	—1.16
Edison	Magunden	3.1	—135.7	.....	—0.83	....	....	—0.83
Magunden	Kern	3.4	—17.8	.....	—0.10	....	....	—0.10

Total distance 67.8.

* Correction for curvature is 0.04 per cent grade for each degree of average curvature.

gallons. If the engineer makes a sudden stop by heavy braking the greater part of this 27.74 gallons is lost in heat at the brake shoes. If his train schedule will permit him to drift down to 25 miles per hour before applying brakes the fuel equivalent for kinetic energy is 6.93 gallons, and 20.81 gallons of fuel will be saved. The curve shows that drifting to one-half of the normal running speed before applying brakes saves 75 per cent of the fuel equivalent for kinetic energy.

There has been much discussion of the question which train should take siding, when trains meet on a single-track line, that the maximum fuel economy should result. Many

TABLE IV—FUEL PER 1,000 TON-MILES—TEHACHAPI

Section		Gallons of fuel per 1,000 ton-miles	
		Eastbound	Westbound
Kern Jct.	Magunden	16.29	6.31
Magunden	Edison	16.43	2.93
Edison	Flag 1	20.86	3.13
Flag 1	Flag 2	6.11	21.03
Flag 2	Flag 3	16.31	3.50
Flag 3	Flag 4	30.71	2.24
Flag 4	Flag 5	26.39	3.35
Flag 5	Flag 6	42.43	2.77
Flag 6	Tehachapi	23.17	4.71
Tehachapi	Summit	20.59	4.24
Summit	Flag 7	5.62	15.19
Flag 7	Flag 8	1.62	15.33
Flag 8	Proctor	6.73	11.27
Proctor	Flag 9	4.35	22.14
Flag 9	Flag 10	2.70	27.17
Flag 10	Flag 11	4.30	19.82
Flag 11	Flag 12	3.06	46.56

elements, other than fuel, enter into the total cost. The fuel burned chargeable to the meet is for two purposes: First for slowing down or stopping to throw switches, and second, for standby while waiting for the other train. The standby losses depend upon time rather than tonnage and have been discussed previously in the second group of factors.

As long as every movement of the train is in the normal direction that the train is traveling, only the extra fuel required for slow-downs or stops should be charged against the meet. Table V gives gallons of fuel burned running through sidings, distance in feet through sidings, weight of

TABLE V—FUEL COST OF MEET PER 1,000 TON TRAIN—TEHACHAPI

Trip	Fuel burned through siding gallons	Distance through siding feet	Weight of train tons	Fuel per 1,000 tons gallons	Fuel for equivalent distance main line gallons	Fuel cost of meet gallons	Station
			Grades Over 2 Per Cent				
2—E	44	4,374	1,030	42.7	34.0	8.7	Allard
4—E	70	4,544	1,018	68.8	35.2	33.6	Woodford
6—E	45	4,544	1,001	45.0	35.2	9.8	Woodford
7—E	45	4,544	1,021	44.0	35.2	8.8	Woodford
8—E	51	4,544	1,018	50.2	35.2	15.0	Woodford
9—E	89	5,468	1,020	87.2	42.4	44.8	Rowen
9—E	45	4,291	1,019	44.2	33.4	10.8	Cable
3—W	40	4,013	1,067	37.5	31.1	6.4	Warren
7—W	65	4,287	1,089	59.7	33.2	26.5	Fram
	Totals		9,283			164.4	
	Average		1,031			18.3	per 1,000 ton train.
			Light Grades				
1—E	25	4,411	1,021	24.5	20.0	4.5	Bena
1—E	18	4,305	1,016	17.7	26.1	6.4	Ilmon
4—E	21	4,411	1,020	20.6	20.0	0.6	Bena
8—W	22	5,315	1,064	20.6	22.2	—1.6	Cameron
			Total			—2.9	
			Average			—0.7	

train, gallons of fuel that would have been burned moving the same distance on the main line, and the extra fuel burned. An analysis of results indicates that taking siding on a heavy grade was quite different from taking siding on a medium grade. The first group in Table No. V is for grades over 2 per cent, and the second group for grades less than 2 per cent. The average fuel cost of taking siding on grades of over 2 per cent is 18.3 gallons. For grades materially less than 2 per cent no extra fuel was burned. The trains do not move at a speed of over 12 miles per hour up heavy grades, so that the fuel required for acceleration is less than 2 gallons per 1,000 ton train. Brakes are applied to hold the train rather than to stop the train. It is believed therefore that the extra fuel burned taking siding on heavy grades is due to the fact that the slow, heavy starting and pulling works the engine beyond its most efficient point, and in several cases the locomotive slipped its wheels. On light grades a freight train moves at a speed of 20 to 35 miles per hour. But trains take siding at low speed on all grades. The drawbar pull per ton is greater at high speed than at low speed, and the fuel saved by moving through sidings at a low and more efficient speed offsets the fuel loss due to braking. It is felt that these results should be applied in general with caution, because fuel used varied between wide limits.

The engineer is held responsible for the fuel charged to

TABLE VI—OPERATING EFFICIENCY—FUEL—TEHACHAPI

Ratio between fuel burned moving train and total fuel burned from 30 minutes before leaving initial terminal until 10 minutes after arrival at home terminal.

Trip	Operating efficiency per cent
1—E	92.6
2—E	96.1
3—E	96.5
4—E	93.9
6—E	89.5
7—E	95.1
8—E	95.7
9—E	95.2
Average eastbound	94.3
1—W	88.3
3—W	90.7
4—W	87.1
5—W	87.7
6—W	93.0
7—W	89.6
8—W	85.1
Average westbound	88.7
Weighted average eastbound and westbound	92.5

road service. Part of this fuel is burned in the actual progression of the train; the remainder is burned in locomotive or train movements incident thereto. The fuel burned in actual train movements depends upon the efficiency of the locomotive and the skill of the engineer. The fuel burned for miscellaneous purposes depends upon traffic conditions and the general efficiency of the division organization in handling traffic. In this discussion the ratio between the fuel burned moving the train and the total fuel charged to

TABLE VII—LOCOMOTIVE THERMAL EFFICIENCY—TEHACHAPI

For a Train of 1,000 Tons—Eastbound

Location		Distance		Equivalent grade per cent	Grade resistance lb./ton	Total resistance lb./ton
From	To	Miles A	Feet B	C	D C × 20	E D + 7
Firing up 90 min.		.....	.....	.....	.....	.....
Standby 60 min.		.....	.....	.....	.....	.....
Testing air 30 min.		.....	.....	.....	.....	.....
Bakersfield	Kern Jct.	0.7	3,700	0.07	1.4	8.4
Kern Jct.	Magunden	3.4	17,950	0.1	2.0	9.0
Magunden	Edison	3.1	16,370	0.83	16.6	23.6
Edison	Flag 1	5.62	29,670	1.16	23.2	30.2
Flag 1	Flag 2	1.004	5,300	—1.22	—24.4	—17.4
Flag 2	Flag 3	6.225	32,860	0.89	17.8	24.8
Flag 3	Flag 4	0.892	4,710	2.21	44.2	51.2
Flag 4	Flag 5	2.179	11,500	1.14	22.8	29.8
Flag 5	Flag 6	23.355	123,300	2.31	46.2	53.2
Flag 6	Tehachapi	1.225	6,470	1.24	24.8	31.8
Tehachapi	Summit	1.8	9,500	0.62	12.4	19.4
Summit	Flag 7	2.078	10,970	—0.42	—8.4	—1.4
Flag 7	Flag 8	1.136	6,000	—1.07	—21.4	—14.4
Flag 8	Proctor	1.486	7,850	0.09	1.8	8.8
Proctor	Flag 9	1.488	7,860	—0.50	—10.0	—3.0
Flag 9	Flag 10	0.852	4,500	—1.69	—33.8	—26.8
Flag 10	Flag 11	1.914	10,100	—0.49	—9.8	—2.8
Flag 11	Flag 12	8.637	45,600	—2.05	—41.0	—34.0
Flag 12	Mojave	0.709	3,740	—1.15	—23.0	—16.0
Mojave to engine-house 60 min		.....	.....	.....	.....	.....
Standing at stations 80 min.		.....	.....	.....	.....	.....

road service is called "Operating Efficiency, Fuel." The operating efficiencies for each trip, averages eastbound and westbound, and for all test trips, are shown in Table VI.

Such a ratio is a measure of the operating efficiency of the division organization. The high value determined by

this test, 92.5 per cent, indicates a co-operation between dispatchers and train crews not often realized. It indicates also a very small margin of possible gain between steam locomotives, well handled, and the theoretical limit of the electric locomotive, 100 per cent less engine auxiliaries. A second track would undoubtedly raise this ratio; but single-track operation does not excuse a low efficiency.

Many changes have been made in locomotive design during the past few years. Larger units, higher boiler pressure, superheaters, and, more recently, the addition of feed water heaters and boosters, have gone a long way toward increasing efficiency. Though the locomotive used for this test is one of the well-known types for heavy mountain service, and was tested under its most economical load, yet the average thermal efficiency is less than 6 per cent; hence a slight numerical increase in this efficiency would result in a tremendous saving in fuel. For example, the Super Power Survey showed an expected fuel saving of 67 per cent in freight service, which means a thermal efficiency of about 8.5 per cent. Whether in electric service such a point is within reach, others must determine. In making such comparisons it is necessary to take account of the ratio, revenue freight weight to total train weight. In this study it was 0.743. In electric service it may be very different. The mechanical engineers of this country will hardly admit that they are satisfied with even the best engine yet designed. The efficiency determined during this test is lower than many published values, but, as a rule, such tests are made with picked locomotives, especially adjusted for the test and operated by the best crews.

It is not desired to give the impression that the values of factors given as the result of this investigation are absolute and applicable to all conditions. It is believed that this method of testing attacks the problem from an entirely different angle, from which it is possible to make, of certain factors, analysis in detail that has not been possible by other methods.

Undiscriminating application of the results of this study easily may produce extremely inaccurate results; for example, where the conditions surrounding the particular problem bear only a remote resemblance to those of the line over which the tests were made. Weather, grade, service and many other conditions have their effect upon train operation. Similar tests should be made in passenger and freight, mountain and valley service, also with other types of power.

TABLE VII—PART 2

Eastbound

Distance miles A	Total weight of train tons F	Total tractive effort pounds G E × F	Million ft. lb. at drivers constant speed H B × G/10⁶	Hp. hr. at drivers constant speed I H/1.98	Thermal hp. hr. for 5.57 per cent efficiency J + only I/0.0557	Computed fuel gallons K J/0.01765
....	.....	.....	.....	.....	.....	90.0
....	.....	.....	.....	.....	.....	20.0
....	.....	.....	.....	.....	.....	21.0
0.7	1,000	8,400	31.1	15.7	281.8	4.9
3.4	1,000	9,000	161.6	81.6	1,464.0	25.5
3.1	1,000	23,600	386.3	195.1	3,502.0	60.9
5.62	1,000	30,200	896.0	452.6	8,121.0	141.4
1.004	1,000	—17,400	—92.2	—46.6	.....	6.0
6.225	1,000	24,800	815.0	411.7	7,390.0	128.6
0.892	1,000	51,200	281.2	121.8	2,186.0	38.1
2.179	1,000	29,800	342.7	173.1	3,106.5	54.1
23.355	1,000	53,200	6,559.0	3,312.0	59,455.0	1,034.7
1.225	1,000	31,800	205.3	103.9	1,865.0	32.5
1.8	1,000	19,400	184.3	93.1	1,671.0	29.1
2.078	1,000	—1,400	—15.4	—7.8	.....	11.0
1.136	1,000	—14,400	—86.4	—43.6	.....	2.5
1.486	1,000	8,800	69.1	34.9	626.3	10.9
1.488	1,000	—3,000	—23.6	—11.9	.....	7.0
0.852	1,000	—26,800	—120.6	—60.9	.....	2.5
1.914	1,000	—2,800	—28.3	—14.3	.....	8.5
8.637	1,000	—34,600	—1,551.0	—783.0	.....	29.7
0.709	1,000	—16,000	—59.8	—30.2	.....	4.7
....	.....	.....	.....	.....	.....	20.0
....	.....	.....	.....	.....	.....	57.0
						1,840.6

TABLE VII—PART 4

Westbound

Distance miles A	Total weight of train tons F	Total tractive effort pounds G E × F	Million ft. lb. at drivers constant speed H B × G/10⁶	Hp. hrs. at drivers constant speed I H/1.98	Thermal hp. hr. for 5.57 per cent efficiency J + only I/0.0557	Computed fuel gallons K J/0.01765
....	.....	.....	.....	.....	.....	90.0
....	.....	.....	.....	.....	.....	10.0
....	.....	.....	.....	.....	.....	21.0
0.709	1,000	30,000	112.2	56.7	1,017.5	17.7
8.637	1,000	50,000	2,281.0	1,151.5	20,670.0	259.7
1.914	1,000	17,200	173.8	87.7	1,574.7	27.4
0.852	1,000	44,400	199.3	101.0	1,811.3	31.6
1.488	1,000	17,000	133.6	67.5	1,211.2	21.1
1.486	1,000	6,000	47.1	23.8	427.1	7.4
1.136	1,000	28,800	172.8	87.3	1,566.7	27.3
2.078	1,000	15,400	169.0	85.3	1,531.7	26.6
1.8	1,000	—5,400	—51.3	—25.9	.....	9.9
1.225	1,000	—17,400	—112.6	—56.9	.....	6.8
23.355	1,000	—30,400	—3,748.0	—1,892.5	.....	86.2
2.179	1,000	—10,200	—117.3	—59.2	.....	9.1
0.892	1,000	—24,400	—115.0	—58.0	.....	2.1
6.225	1,000	—8,000	—262.9	—132.8	.....	26.0
1.004	1,000	34,600	183.4	92.6	166.7	28.9
5.62	1,000	—16,200	—480.7	—242.7	.....	24.2
3.1	1,000	—9,600	—157.2	—79.3	.....	10.5
3.4	1,000	5,000	89.8	45.3	813.7	14.1
0.7	1,000	5,600	20.7	10.5	187.8	3.3
....	.....	.....	.....	.....	.....	20.0
....	.....	.....	.....	.....	.....	75.5
						956.4

TABLE VII—PART 3—LOCOMOTIVE THERMAL EFFICIENCY—TEHACHAPI

For a Train of 1,000 Tons—Westbound

Location From	Location To	Distance Miles A	Distance Feet B	Equivalent grade per cent C	Grade resistance lb./ton D C × 20	Total resistance lb./ton E D + 7
Firing up 60 min.		.....	.....	.....	.....	.....
Standby 30 min.		.....	.....	.....	.....	.....
Testing air 30 min.		.....	.....	.....	.....	.....
Mojave	Flag 12	0.709	3,740	1.15	23.0	30.0
Flag 12	Flag 11	8.637	45,600	2.15	43.0	50.0
Flag 11	Flag 10	1.914	10,100	0.51	10.2	17.2
Flag 10	Flag 9	0.852	4,500	1.87	37.4	44.4
Flag 9	Proctor	1.488	7,860	0.50	10.0	17.0
Proctor	Flag 8	1.486	7,850	—0.05	—1.0	6.0
Flag 8	Flag 7	1.136	6,000	1.09	21.8	28.8
Flag 7	Summit	2.078	10,970	0.42	8.4	15.4
Summit	Tehachapi	1.8	9,500	—0.62	—12.4	—5.4
Tehachapi	Flag 6	1.225	6,470	—1.22	—24.4	—17.4
Flag 6	Flag 5	23.355	123,300	—1.87	—37.4	—30.4
Flag 5	Flag 4	2.179	11,500	—0.86	—17.2	—10.2
Flag 4	Flag 3	0.892	4,710	—1.57	—31.4	—24.4
Flag 3	Flag 2	6.225	32,860	—0.75	—15.0	—8.0
Flag 2	Flag 1	1.004	5,300	1.38	27.6	34.6
Flag 1	Edison	5.62	29,670	—1.16	—23.2	—15.2
Edison	Magunden	3.1	16,370	—0.83	—16.6	—9.6
Magunden	Kern Jct.	3.4	17,950	—0.10	—2.0	5.0
Kern Jct.	Bakersfield	0.7	3,700	—0.07	—1.4	5.6
Bakersfield to Enginehouse 60 min.						
Standing at station 106 min.						

LIST OF FACTORS

	Unit	Value
First Group		
Fuel to fire up with water at 60 deg. fahr.	Gallons	167
Fuel to fire up with water at 120 deg. fahr.	Gallons	131
Fuel to fire up with water at 180 deg. fahr.	Gallons	96
Second Group		
Fuel to hold under steam, in enginehouse, without auxiliaries—per hour	Gallons	17.4
Fuel to hold under steam, out-of-doors, with auxiliaries—per hour	Gallons	36.6
Fuel to hold train on siding—per hour	Gallons	42.8
Third Group		
Train resistance—Hood & Schmidt	Pounds	7
Total train and locomotive resistance—level track	Pounds	11.7
Average overall thermal efficiency	Per cent	5.57
Maximum overall thermal efficiency	Per cent	6.41
Fuel per 1,000 ton miles per per-cent grade without friction	Gallons	14.7
Locomotive internal friction in terms of maximum drawbar pull	Per cent	9
Fuel cost of meet per 1,000 ton train on grades of 2 per cent or over	Gallons	18.3
Fuel cost of meet per 1,000 ton train on light grades	Gallons	0.0
Average operating efficiency—fuel	Per cent	92.5

THE MISSOURI STATE TAX COMMISSION has added $3,000,000 to the taxable value of railroad property in the state by listing coal, oil, machinery, spare equipment, office fixtures and other property which heretofore has not been assessed.

Future Company Accounting and Disbursement*

Some Criticisms of Present Methods and Suggestions for Simplification—The Pay-Before-Audit System

By Colonel Charles Hine

THE ACCOUNTING and disbursement practices of American corporations, including railways, have been developed from the conception that normally only the treasurer or his representative in the treasury department should disburse funds. The underlying theory is that concentration in one department permits the conducting of business with a minimum of working funds, with a minimum of administrative expense for disbursement itself; that duplication of payment is prevented; that errors, excess, or fraud is minimized; that nothing justifies a discrepancy in the payment of money. The original idea was that the treasurer as a fiscal expert would so fully appreciate the value of money that the corporation's interests would be safeguarded by holding up payment until such superjudge could feel certain that value received was being obtained when the disbursement was finally and reluctantly made.

When the corporation was so small that the treasurer personally scrutinized every disbursement the fallacy of this reasoning was less apparent. Nowadays much of the work of the treasurer is delegated to faithful but view limited clerks. In theory they can catch mistakes and protect the company. In practice they perfunctorily complete for payment the documents originating in or coming from other departments.

In earlier practice the treasurer paid bills, vouchers and payrolls on an appropriate certification of the official or employee responsible for the expenditure. Later practice is for all bills, vouchers and payrolls to pass through the accounting department for audit and certification before payment is made by the treasurer. If the auditor could personally scrutinize every item of the transactions, this audit might mean something. As it is, the auditor delegates his functions to his own faithful but view limited clerks, who likewise perfunctorily interweave their own little loop in the weak chain of red tape.

System Encourages Evasion of Responsibility

Perfunctory action is demoralizing to alertness of thought and promptness of action. Both the treasury and the accounting departments base action upon the appropriate certification by the responsible official or employee of such integral documents as bills, invoices, and payrolls. The virility of such certification is lessened by the fancied security in the erroneous idea that mistakes will be caught in the accounting department. Formerly some arithmetical errors were so caught. The advent of business machines of one type or another on which payment documents are usually made has insured arithmetical accuracy and has eliminated the necessity for arithmetical audit.

The whole modern system of corporation accounting and disbursement encourages evasion of responsibility, popularly known as passing the buck.

Financiers lay down the dictum that normally a proper safeguard is to require at least two signatures for every transaction so that fraud cannot be perpetrated without collusion of at least two individuals. This generalization is too sweeping to be sound. Human nature usually has limits to individual integrity. The crux of the practical question is how far human nature can be trusted in a given case. Manifestly, where hypothecation of securities might be sufficient to tempt a man to try to make himself comfortable for life, a wise precaution is to require the presence and participation of at least two persons before a safe deposit vault is opened. This is far different from presuming defalcation when the amount of money available is too small to tempt the individual concerned. How many sane persons of years of tenure with a corporation will risk both a job and community standing for a month's pay? How many reputable purveyors of material will risk loss of custom and business reputation for a few fraudulent invoices of materials and supplies?

Even granting the necessity in all cases for two signatures, the present day transaction involving money passes through the hands of from six to ten persons before payment is made. This circumlocution usually requires from three to ten days.

It is true that bills carrying special discounts are rushed through the administrative labyrinth. It is also true that such expediting correspondingly slows down all the others. It is idle to say that this delay is not reflected in increased prices from the purveyor to cover the use of money during the tedious period of delivery certification, so-called auditing and payment.

A Fatuous Desire for Deadly Uniformity

The fundamental defects of present accounting and disbursement flow from a fatuous desire for deadly uniformity. The locomotive engineer of twenty years tenure is entitled to a different presumption as to payment from the immigrant laborer of 20 days' service. As a matter of fact, the floater employee receives the greater consideration of the two. To meet his pressing needs and retain his services the company devises a so-called emergency system of daily or weekly payment. The locomotive engineer, however pressed by such sudden family demands as sickness and death, must await a prescribed pay day. To argue that daily or frequent payment discourages thrift is to disregard what has been well termed the eleventh commandment of modern industrial life, "Thou shalt not take thy neighbor for granted."

Some of the most thrifty individuals are those who are paid daily. Thrift is a matter of the individual. Americans are able to think for themselves and properly resent having such intimate, personal decisions made for them.

The disbursement methods of American corporations in general and of American railroads in particular are directly opposed to those of the largest of corporations, the United States Government.

Our first President, George Washington, was not only a great general, but, as America's wealthiest citizen, was one of its leading business men. Throughout the Revolutionary War his pre-war personal deposits remained in London in the businesslike Bank of England. Our first secretary of the treasury, Alexander Hamilton, was a financial genius.

Methods Used By the Government

Such men early comprehended the fact that civilization and business depend alike upon the development of individual character and an individual sense of responsibility; that individual liberty depends upon balanced safeguards for property rights; that civilization without property and labor without capital are impossible conditions.

Under the guidance of these two great men, assisted by able

*An address delivered before the Southeastern Accounting Conference, Atlanta, Georgia, May 3, 1923.

subordinates, a pay-first-audit-afterwards system of disbursement was inaugurated which has well stood the test of a century of practical operation. The function of the Treasurer of the United States is through various collecting agencies to receive and account for revenue. On the disbursement side it is his function to allot funds under proper authority to thousands of disbursing officers who pay bills before final audit. Under this flexible common-sense system the cases of defalcation comprise a negligible percentage of the total billions of dollars handled.

Certain preferred classes of public servants, like officers of the army and navy and of the consular service, pay themselves by drawing against the treasurer of the United States their own unsupported pay drafts which clear automatically through banks. Audit is made after the fact by measuring against such definite standards as service periods and compensation allowances. Rarely and very rarely some weak brother, tempted beyond his strength, abuses this privilege, fraudulently multiplies his pay drafts, deserts, and leaves the government and the banks as losers. These few cases do not cause a change in the system. The loss is figuratively speaking charged to the development of morale. Practice is based upon a high average of integrity of the many rather than upon the weakness of a few. The sociological effect is apparent in the high standard of loyalty and honor developed in the classes thus trusted.

Private corporations, however, attempt to audit before payment, which leaves within the corporation itself no independent, disinterested agency to audit the auditor and the whole transaction. This unscientific and demoralizing conception flows from the mistaken idea that the treasurer and his representatives alone are qualified to make a safe disbursement of money. Those who inveigh against government red tape should first examine corporation red tape.

When reputable purveyors are permitted, subject to future adjustment, to accompany invoices with sight drafts, the stockholders and the public will benefit in lower prices to a greater extent than the interest unearned on funds kept available to meet current demands. When, subject to future audit, trusted employes of corporations, for example, locomotive engineers on railways, draw their own daily pay drafts against limited budget allowances placed with local banks, the corporation will receive better service. More employees will advocate fair returns for capital and will oppose hostile legislation.

The outstanding objection to the present-day methods of corporate disbursement and accounting is the neglect of the best human elements. Disbursement and accounting officers in the name of fraud prevention arbitrarily decide vital phases of the great sociological questions of relations between management and men; between corporations and legislatures; between railways and the public; between thrift and communism.

The fatal desire for deadly uniformity of method results in the sin of leveling down, a sin as reprehensible in managements as in labor unions.

An incidental objection to these methods is the unnecessary cost of present-day accounting. Critics scold, and managements defend, but clerical expense increases. Railway executives who have not found time to master the details of accounting vainly cite the arbitrary requirements of the Interstate Commerce Commission as a convenient alibi.

A Greater Use of the Local Banks

When accountants and executives cease to deny to intelligent employees the ability to state a simple arithmetical account on a time slip or other primary document; when workers, from the self-interest of prompter payment and of greater official appreciation of individual effort, have a pride in initial recording of performance, the corporations will employ fewer clerks. Common school education has reached many thousands of employees since current accounting practices were conceived.

Another changed condition is the development of an extensive number of officially supervised banks. The earliest of America's big corporations, the railways, came into being during a period of wildcat banking. The charters of early railways often included a banking feature. Railways had to distribute their own funds.

These local banks depend for existence upon local confidence, which is obtained through local management by local men. The railways might become more identified with the public by utilizing a bank at every station on the line where there is a bank. The farmer visiting the county seat of an afternoon would think, "There goes up the street our agent of our railroad to deposit our day's money in our bank." At present, from his viewpoint, his money is sent by express by their agent to their banks for them to dole out to his neighbor employee when they get good and ready.

Still another recent development of change is the budget which estimates periodical expenditures within two to five per cent of the actual. When the railways were pushing forward under frontier conditions and with a shifting personnel it was difficult both to stabilize expenditures and to insure integrity of performance. Today an approved budget could be made authority for the treasurer to place to the credit of local officers and agents the prescribed amounts of money for disbursement. The budget could likewise be made the authority for an agent already receiving revenue to disburse therefrom as prescribed.

When, subject to future audit and prescribed budget limits laid down for the bank, the station agent and the section foreman, it becomes possible for the station agent to pay the local trackmen through the local bank from funds locally collected the railways will both receive better service and will be closer to their public. Seasonal fluctuations among other causes may necessitate transfer of funds from bank to bank. It is conceivable that within budget limits an agent might be authorized to pledge the company's credit at the local bank in order to meet current authorized disbursements.

When, subject to future audit, the machinist of prescribed tenure makes in duplicate a time slip which for a limited number of days becomes cash at the local bank, the duplicate turned in through the foreman will from self interest be so accurately made as to insure real and inexpensive cost accounting. Men will learn that time clocks, individual bench recorders and the like are a protection for the man himself, as well as for the management.

A Lessened Cost of Accounting

Present systems of payment breed a contempt for right and justice. The inclination of the employee, at first honest, veers toward putting something over on the timekeeper. It is the duty of managements and of employees' associations to teach men that fudging a time slip should be as much of a social disgrace as burglarizing a grocery store. Men not only seldom begrudge a privilege honestly earned, but guard that privilege jealously. The men themselves will eventually be the first to deny to the unworthy comrade the privilege of drawing his own time slip draft. At the Altoona works of the Pennsylvania Railroad System the monthly conference of the works committee with the works manager is opened with prayer by a workman member. Such earnest Americans can be trusted to help bring about righteous dealing or mankind is indeed in a hopeless condition.

It is believed that all these things can be done at a lessened cost for accounting and disbursement. The reasons are that business machines and processes have brought about an unappreciated possibility of simplification through a revision of previously accepted theories.

During most of the last century a document could be

duplicated only by the laborious, tedious process of hand copying. Arithmetical totals could be obtained only by transcribing and adding. Obviously, original documents could not well be carried through to the conclusion of a transaction. Accordingly the gist of the document was drawn off on abstract sheets which both carried the information to other offices and served as adding sheets to arrive at necessary totals. The basis of accounting and auditing became these intermediate control sheets. Examples include payrolls, abstracts of waybills, abstracts of invoices, abstracts of materials issued and abstracts of authorities for expenditure. These are second-hand information at best and subject to errors in transcription.

The inconvenience of an abstract is that as long as any item remains unchecked the whole sheet cannot be cleared without setting up a new sheet. The receiving office uses the sheet by dealing with individual items and in effect tearing it to pieces. The conductor's wheel report is literally chopped to pieces in the car acountant's office line by line or car by car. The wheel report however, is a complete document and not an abstract. It serves first as a convenient working tool in dealing with the train as a complete unit composed of smaller units, the individual cars. Sequence means something in enabling the conductor to identify cars by position while handling the train. Pay rolls and other abstracts are incomplete documents in which sequence of items is meaningless and sometimes inconvenient.

The limitation of an abstract is the restriction of its usefulness to the data drawn off. A sudden request for unexpected information necessitates recourse to primary documents and the setting up of new abstracts to obtain totals. When the primary document can be made to clear itself a desirable flexibility is introduced. If all the numerical information on such a primary document as a time slip, a freight way-bill, or a material invoice is punched on a Hollerith card, any totals desired can be quickly obtained through sorting and tabulating machines.

Sheeting up, as it is called, has been the backbone of accounting and auditing. Clearing through a journal entry has been the life saver. Machines of various kinds obviate the necessity for the sheet. The Computing-Tabulating-Recording Company in its own internal accounting posts directly from machines to ledgers and files the Hollerith machine totals in lieu of journal entries. Flowers for the beloved departed may be omitted.

Some Possibilities of Simplification

A further step in simplification will be the development under the law of supply and demand of cheaper processes for photographic reproduction of documents. Then machine totals from primary documents will be posted to master records and photographic copies thereof distributed in lieu of reports.

Such naked totals will be audited as desired by traveling or resident auditors having access to files of original documents in prescribed offices of record. The auditor in many cases will go to the documents not the documents to the auditor. One form of audit will be to make surprise test runs of selected files of Hollerith cards. A refinement will be the supervised punching of new cards from designated files of primary documents. In extreme cases new cards will be punched for all the supporting documents of the period under review.

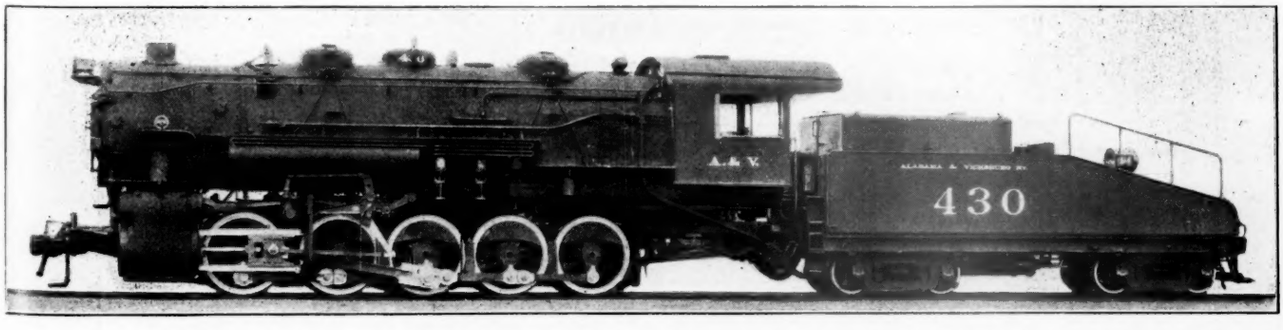
These methods will lend themselves peculiarly to the elimination of the expensive and nerve-racking abstracts of intermediate control sheets. Examples include payrolls, abcarriers.

The primitive necessity for abstracts forced the setting up of new documents to prevent further handling of a bewildering multiplicity of original papers. The time slip is posted to the time sheet, the time sheet to the pay roll and the pay roll to the pay check. These three operations convert several time slips into one pay draft. It is believed that with business machines utilized to their full effect it will prove simpler and cheaper to convert each time slip into a pay draft and carry all through to final payment and subsequent audit. Practical experience alone can test this belief. If it so turns out then the good old pay roll as such is doomed. Already the banks in Akron, Ohio, accept as pay checks of the Northern Ohio Traction & Light Company its Hollerith cards with punched instead of written amounts.

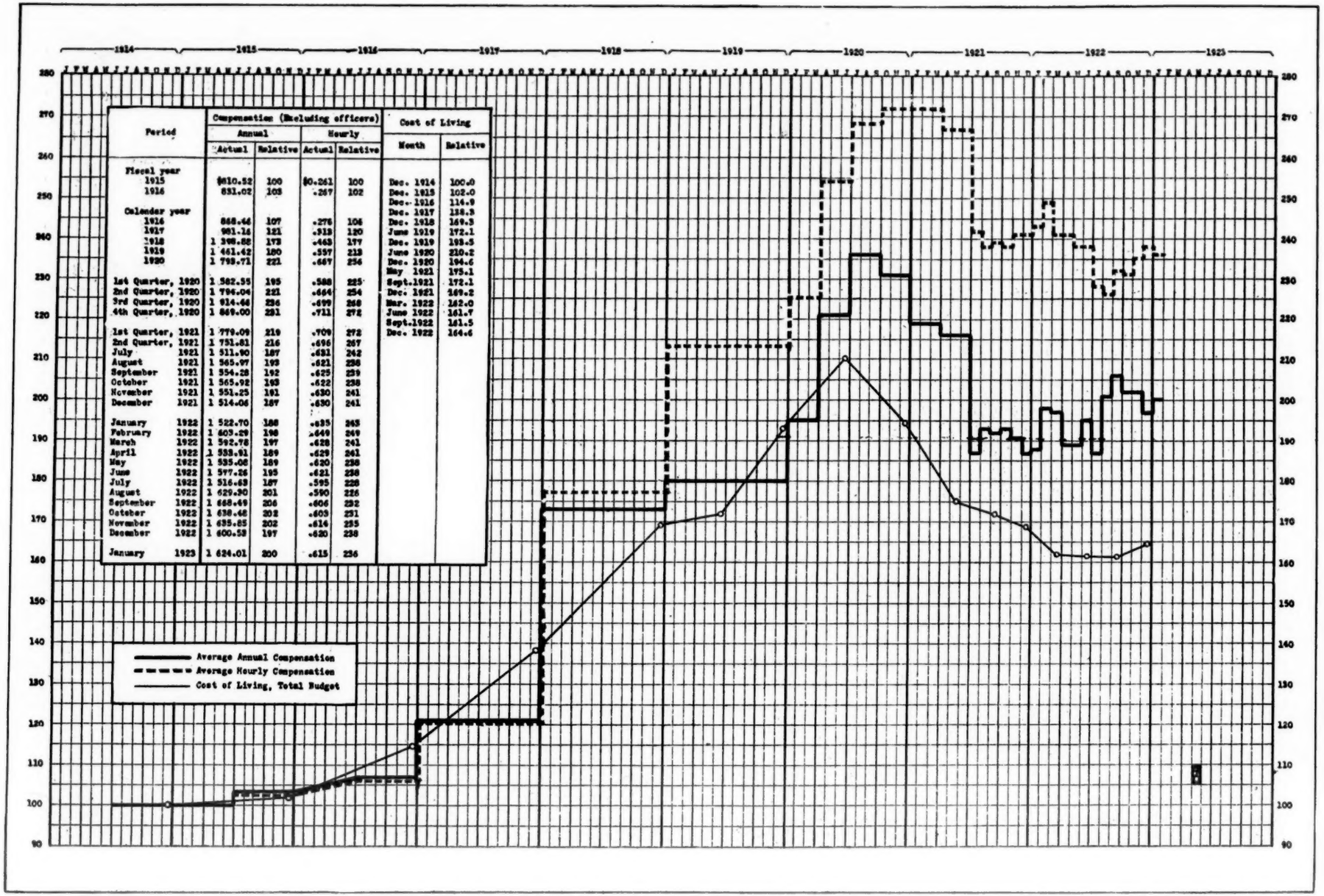
In the *Railway Age Gazette* of September 8, 1916, the speaker outlined a proposed method of simplified freight station accounting. It is based on the elimination of abstracts and the matching in the auditor's office of the paid way-bill received, against a duplicate from the forwarding agent. Until the originating carrier renders a copy of interline billing it might be necessary to have the junction agent make and render a photographic copy of the passing waybill.

These tentative conclusions are not those of a college professor or of a closet philosopher. They flow from practical experience in the railway ranks and from years of successful management of men and money. In brief outline, without elaboration of detail, they are offered in a spirit of helpfulness for the future, not in criticism of a praiseworthy but seemingly outgrown past.

The railways of America, considering the complexities of their undertaking and the far flung extent of their terrain have the hardest peace time problem of the ages. Demagogic and socialistic propaganda to the contrary notwithstanding, their achievements have not been excelled in human history. Once the splendid personnel of officials and employees appreciate the necessity for further simplification and progress the practical, economical application of sound sociological principles will be forthcoming.



Ten-Wheel Switcher, Tractive Effort 78,200 lb., Built for the Alabama & Vicksburg by the Baldwin Locomotive Works



Period	Compensation (Excluding officers) Annual Actual	Annual Relative	Hourly Actual	Hourly Relative	Cost of Living Month	Relative
Fiscal year						
1915	$810.52	100	$0.261	100	Dec. 1914	100.0
1916	831.02	103	.267	102	Dec. 1915	102.0
					Dec. 1916	114.9
Calendar year					Dec. 1917	138.3
1916	868.46	107	.276	106	Dec. 1918	169.3
1917	981.16	121	.313	120	June 1919	172.1
1918	1 398.82	173	.463	177	Dec. 1919	193.5
1919	1 461.42	180	.557	213	June 1920	210.2
1920	1 799.71	221	.667	256	Dec. 1920	194.6
					May 1921	175.1
1st Quarter, 1920	1 582.55	195	.588	225	Sept. 1921	172.1
2nd Quarter, 1920	1 796.04	221	.664	254	Dec. 1921	169.2
3rd Quarter, 1920	1 914.44	236	.699	268	Mar. 1922	162.0
4th Quarter, 1920	1 869.00	231	.711	272	June 1922	161.7
					Sept. 1922	161.5
1st Quarter, 1921	1 779.09	219	.709	272	Dec. 1922	164.6
2nd Quarter, 1921	1 751.81	216	.696	267		
July 1921	1 511.90	187	.631	242		
August 1921	1 565.97	193	.621	238		
September 1921	1 554.28	192	.625	239		
October 1921	1 565.92	193	.622	238		
November 1921	1 551.25	191	.630	241		
December 1921	1 514.06	187	.630	241		
January 1922	1 522.70	188	.635	243		
February 1922	1 603.29	198	.649	249		
March 1922	1 592.78	197	.628	241		
April 1922	1 538.01	189	.629	241		
May 1922	1 535.06	189	.630	238		
June 1922	1 577.26	195	.621	238		
July 1922	1 516.63	187	.595	228		
August 1922	1 629.30	201	.590	226		
September 1922	1 668.49	206	.606	232		
October 1922	1 638.46	202	.603	231		
November 1922	1 635.85	202	.614	235		
December 1922	1 600.59	197	.620	238		
January 1923	1 624.01	200	.615	236		

Average for Fiscal Year 1915=100. Data from Interstate Commerce Commission and United States Department of Labor. Chart Adapted from That Prepared by Bureau of Railway Economics.

Comparison of Railway Employee Earnings, Class I Carriers, with Cost of Living

A.R.A. Transportation Division Meets in Chicago

Reports Presented by Six Committees Dealt Largely with the Revision and Interpretation of Rules

THE TRANSPORTATION DIVISION of the American Railway Association met at the Blackstone Hotel, Chicago, for its annual meeting on April 25. J. J. Bernet, president of the New York, Chicago & St. Louis, and chairman of the division presided. After a talk by R. H. Aishton, president of the association, on the program of the railroads to provide adequate transportation service this year, M. J. Gormley, chairman of the Car Service Division of the American Railway Association, described the results accomplished by that division. Reports were also presented by the General Committee and by the committees on Car Service; Demurrage; Storage; Reconsignment and Diversion; Freight Handling Service; Railroad Business Mail and Records.

The Opportunity of the Transportation Division

R. H. Aishton, president of the American Railway Association, referred to the performance of the railroads under the conditions with which they had to contend during the last 12 months. His remarks, in part follow:

"I do not know of any performance reflecting so much credit on the transportation machine or that does so much to indicate to the shippers and the public generally that the machine had not broken down. Today you have impressed generally in the minds of the shippers that the railroads have come back.

"In making the statement, I am not unaware that there is a lot of dissatisfaction, not only among the shippers in some districts, but even to a greater degree among the railroads. But in spite of all that disagreement and dissatisfaction I want to say a word of commendation for the wonderful task that the transportation people performed in the last year. It has had the appreciation of the Interstate Commerce Commission and during all these strenuous times there was not a moment that the Interstate Commerce Commission did not have the most sympathetic and helpful attitude towards the Car Service Division. There never was a moment when they were not willing to do anything that promised relief.

"The second word I have to put before you is hope. The railroads in this country have signed a promissory note in the program for 1923 (published on page 919 of the *Railway Age* for April 7), which has a date of maturity for the various obligations contained in that note, varying from August to October. They cover the essential things that are necessary to meet the peak load of transportation. On the promise of your payment of every stipulation in that 'note' depends very largely the future of the railroads of this country. This note is not given to the Interstate Commerce Commission or to the American Railway Association, but to the American public; that means that every shipper and every man, woman and child in this country who is interested in transportation is going to look to you for the fulfillment of the obligations contained in that note. The failure on the part of the railroads collectively or of a railroad individually to meet that obligation is going to create an adverse opinion against the transportation interests of this country that will be hard to overcome. If the obligations contained in that note are met there is not much question but that the transportation needs of the country are going to be measurably well met. After all what is in the minds of the people of this country? Service. If you succeed in giving the people service there will be no very serious transportation question.

"Referring to the second paragraph of item ten in the program which says that the railroads pledge themselves to a renewed and effective compliance and co-operation with the directions of the Car Service Division, that paragraph not only contains a pledge of compliance with the Car Service rules but the Car Service rules and the Car Service Division are one and indivisible and the effectiveness of your program depends in no small degree on the appreciation of the railroads of the importance of the renewal of that pledge. That pledge will be ineffective unless you make up your mind that insofar as that paragraph is concerned that you are going to make the payment. Unless you do, the public will not get the service to which it is rightfully entitled.

"We have had a great deal to say about the lack of co-operative effort of employees. How much of that is due to a lack of understanding of the problem and the policies of the railroads. Is it not possible that if your own men understand that this is an absolute obligation of the railroads to carry out and that his railroad has even gone further than to indicate to the people that transportation service is going to be 100 per cent, the psychology of this whole thing will be changed and you would have the people generally in this country shouting for you instead of many shouting against you.

"The other word I have in mind is caution and my mind is running somewhat along the work of your Transportation Division. The Car Service division at Washington is a creature of your organization. You are responsible for it; you made the recommendation how it should be organized and more than all that you made the rules and told them what to do. They are trying as well as they know how to carry out your instructions. They have a difficult time in getting the rules changed under which they are working or getting new directions to work under. In the west and in the east I hear great pressure for a penalty rule, penalizing the non-observance of car service rules. I do not know what the answer is. The association tried it four or five times, inflicting penalties running all the way from 75 cents up to $25. As near as I can find out there never was a cent paid or collected for a penalty imposed.

"Of course, there is a penalty today. In my mind the greatest penalty today exists for the non-observance of car service rules. If you do not observe the car service rules and if you do not do the job somebody will do it for you. Lots of people are willing to do it for you. The Interstate Commerce Commission has authority under the law to do it for you. Maybe it would help to have a penalty. I do not believe you can afford to let go of that until you have thrashed out every angle and have the right answer. If a penalty is not the answer, say what the answer should be. Because if your organization fails to carry out those rules you are ultimately going to lose that facility of the railroads and possibly other things with it. There is so much discussion of these questions that you cannot afford to ignore them. The answer should be provided and should be provided between now and this summer."

M. J. Gormley Talks on Car Movement

M. J. Gormley, chairman of the Car Service Division of the American Railway Association, discussed the car situation in part as follows:

"The heavy movement is one answer to the car shortage. The heavier movement and the increased loading gives everyone reason to feel optimistic as to the future. We have recently issued orders in the eastern territory for the movement

of cars to the west, which we believe will meet the western agricultural situation this year. We realize that moving cars in fleets is expensive and we want to avoid this, but if the orders now in effect do not put the cars in the west that are needed to meet the agricultural movement at the time they are needed, we must resort to the fleet movement of equipment from the east and the southeast to the western producing sections.

"I saw some figures the other day that indicated that the western lines are not using eastern cars for eastward movement and holding their own cars on their own rails to the extent that they ought. The percentage of western line cars loaded on western tracks with other than grain products and moving through one terminal indicates that the remedy does not all lie in the movement of the cars from the east.

"The percentage of empty car miles is supposed to be one measure of the efficiency of operation of a railroad. Charts in my office show that beginning with the first of last July and continuing for six weeks, we had the most efficient operation measured by the percentage of empty car mileage that we have had in this country for a great many years. Why? The empty cars stood still and that was the main cause of the trouble last fall. With this heavier movement of traffic we have an increase in the empty car mileage. In other words, we cannot supply the cars if we don't move them. In my opinion what we have to watch in empty car mileage is to avoid cross-haul of empty cars of the same class on the same operating division. I do not believe any transportation officer knows whether he is cross-hauling empty cars of the same class unless he has a record before him that will give that information.

"Suppose that some scheme was devised whereby the division superintendent was charged with the per diem on the cars held empty on his division. Would he permit cars to stand at one point for six or seven days? I don't believe he would. I believe this would constitute one of the measures of his efficiency. One-fourth of the railroad valuation today consists of the equipment of the country and I maintain that there is less known about what is accomplished with that one-fourth of the valuation than is known of the rest of the property combined. We will never reach the point where we can eliminate car shortage entirely until we know what happens to the cars and that we do not permit the cars to stand around.

"We hear a great deal of talk about the shippers' responsibility, and that equipment is in the hands of the shipper one-third of the time. I don't know whether this is true or not but before we begin to talk about that we should clear our own skirts. I am a firm believer in the fact that there are enough car units in this country today to do the business if the cars are properly handled. That means that cars must be moved without delay, loaded and empty and loaded to their capacity.

"As to car service rules, we had an equalization rule in effect at one time. I do not know why it was taken out but I imagine it was due to the fact that we could not make ownership and equalization mix. Possibly there is some middle ground and equalization could be effected as between the east and west through points like Chicago, Peoria and St. Louis. I believe that this question ought to be investigated by the Transportation division to determine whether that would be desirable and also whether equalization is the thing we want."

Report of the General Committee

Since its last report the General Committee has approved the application of 19 roads for admission to the Car Service and Per Diem Agreement and recommended the suspension from the agreement of seven roads. The changes in Per Diem Rule 5, and the Revised Code of Switching Reclaim Rules were approved to take effect March 1, 1923.

Various suggestions were made as to methods for securing better enforcement of the car service rules. After careful consideration it was the opinion of the committee that in order to obtain the best results each railroad should be required to maintain such supervisory organizations as may be necessary to insure a complete understanding and observance of the rules in order that the responsible officers of each road may be currently informed of the situation. The committee also recommended that each road should maintain such records as may be necessary to indicate the extent to which the car service rules are being enforced and furnish a copy of this information periodically to the Car Service division. It also recommended that the Car Service division conduct a more active campaign to supervise the application of car service rules and conduct investigations including such examination of car records as may be necessary to insure the observance of the car service rules and of any orders issued by the Car Service division.

On recommendation of the committee the Board of Directors called the attention of the members to continued violations of Car Service Rule 12 and Interchange Rule 36, prohibiting the placing of advertisements or placards by shippers upon freight cars, and urged upon the officers of these roads the necessity for a more rigid enforcement of these rules.

The General Committee has recommended that the Traffic division formulate a uniform traffic rule providing a penalty charge of at least $10 per car per day for peddling or vending fruits and vegetables from freight cars standing on railroad tracks, this charge to be in addition to the regular demurrage and track storage charges.

The Code of Per Diem rules is being reprinted in a form to show the interpretations that are in effect in connection with each rule. Future interpretations will be printed in the same manner so that those which are currently in effect can be readily located.

An exhibit accompanying this report contained a summary of freight cars owned, their cost and the cost of maintenance for the year ending December 31, 1921. One table shows that the cost of repairs, replacements and taxes totaled 20.17 cents per car per day in 1908 and that there was a gradual increase until 1920, when the high figure of 75.94 cents per car per day was recorded. In 1921 this dropped to 64.79 cents. Another table showed the equipment by capacities as of December 31, 1921, while another table showed the per cent of cars destroyed, ranging from 4.80 in 1906 to a low figure of 1.54 in 1919. The percentage in 1921 was 2.24. The percent of cars acquired in 1902 was 10.47; 11.56 in 1906; 10.95 in 1907, while the lowest percentage was 2.16 in 1921. There has been a gradual rise in taxes in cents per $100 cost of car from 31.10 in 1902 to 77.30 cents in 1921.

The committee on demurrage, storage, reconsignment and diversion stated that experience under the recodification of the National Car Demurrage Rules indicated the necessity for some additional changes in the Code to clarify the rules after result in more uniform enforcement. These changes after having been considered in joint conference with the Committee on Demurrage of the National Industrial Traffic League and representatives of the Interstate Commerce Commission, were recommended for approval by the Transportation Division.

Changes in revised per diem rule 5, and the code of switching reclaim rules were presented by the committee on records in the form of an exhibit. The revised rules provide a uniform method for determining the arbitrary reclaim allowance, permit roads in any locality to establish reclaims on the basis of actual time required to switch cars, remove opportunities for controversies and disputes by making the code of switching reclaim a part of per diem rule 5 and insures the car owners per diem earnings on their own cars when they are handled in switching service for other roads. The atten-

tion of the committee has been called to the various methods of counting private cars in the possession of railroads in determining the number of cars on lines for use in compiling the various reports required for car accounting officers. In the interest of uniformity and accuracy the committee recommended the adoption of a uniform method for use by all railroads which was presented as exhibit C. Some tank car owners do not require detailed monthly statements of mileage by individual car numbers; others of the smaller privately owned tank car lines insist upon being supplied with this information. Consequently, arrangements were made whereby the railroads will supply the tank car owners the information upon specific request. Other items this committee reported on included the equalization of mileage on tank cars of private ownership; methods for rendering bills for excess empty mileage made by tank cars of private ownership; excess empty mileage caused by error or misrouting by carrier; mileage allowance on private cars and assignment of reporting marks.

The Committee on Car Service presented a number of revisions of rules for adoption. It also called attention to circular 2308 issued on October 19, 1922, by the Board of Directors calling attention to the non-observance of Pier Diem Rule 6 and urged all subscriber roads to enforce the provisions of the rule so as to avoid discrimination as between non-subscriber roads and directed that the transportation division develop the extent to which Per Diem Rule 6 is being enforced. The committee has issued a circular to this purpose.

Committee on Freight Handling Service

The report of the covered rules governing the loading, stowing, bracing and handling of package freight; methods of blocking, bracing and bulk heading carload shipments of liquids in barrels; rules for loading carload shipments of any product; prevention of pilferage through ice bunkers and hatches of refrigerator cars; trimming coal on freight cars, destination inspection of fresh meat, packing house products and fresh fruit and vegetables; standard shipping tags and package fiber board, packages with description of contents. The committee gave careful consideration to the methods now in use for loading liquid commodities when barrel containers are used. As a result of its investigation the committee has found that three plans are now being used successfully in various regions. These plans, consisting of three drawings and instructions, were submitted as exhibit B to the report.

The committee was of the opinion that a great deal of loss could be eliminated through proper inspection of sewer pipe and other kindred clay products at the important loading points. The results obtained from such inspection could be used in formulating proper loading rules and data for necessary changes in the classification. The committee made certain recommendations to the traffic division in this connection. The committee urged that owners of refrigerator cars who have not already installed burglar proof devices do so in order to prevent the pilfering of freight through ice bunkers and hatches. The instructions for trimming coal have been revised and brought up to date. These instructions are contained in circular No. D.-21-118 shown as exhibit D. In connection with the instructions two drawings are given to show the manner in which coal shall be trimmed on freight cars.

The committee on railroad business mail reported that a conference was held in Chicago on April 5, 1922, with a special committee representing the Railway Accounting Officers Association, at which an agreement was reached as to a suitable form for standard waybill envelope, and the joint recommendation was approved by the Railway Accounting Officers Association at its meeting in June, 1922. The committee also recommended that the provisions of paragraph "C" of rule No. 3 of the regulations covering the handling of railroad business mail to be called to the attention of all concerned. It has developed that some roads were not properly preparing claim papers and similar matter for transmission to roads not an immediate connection. The committee is in touch with various roads with reference to improved methods in handling railroad business mail and in correcting misunderstandings of certain railroad employees, particularly agents at junction points, in connection with the regulations for handling railroad mail.

General Committee Election

The following were elected members of the general committee: C. M. Sheaffer, chief of transportation, Pennsylvania, and C. H. Ewing, vice-president, Philadelphia & Reading. E. P. Bracken, vice-president, Chicago, Burlington & Quincy, and B. B. Greer, vice-president, Chicago, Milwaukee & St. Paul.

Labor Board Gets More Wage Increase Petitions

THREE PETITIONS for wage increases have been presented to the Railroad Labor Board during the past week by labor organizations representing station workers, expressmen, maintenance of way employees and shop laborers. The Brotherhood of Maintenance of Way Employees and Railway Shop Laborers filed a request on April 25 for pay increases ranging from 8½ to 15 cents per hour. The increases requested are as follows: Shop foremen and assistant foremen, 15 cents an hour; section foremen and assistant foremen, 11 cents an hour; mechanics, 14 cents an hour; mechanics helpers, 8½ cents an hour; trackmen, 15 cents an hour and track laborers, shop laborers and watchmen, 11½ cents an hour. The application affects more than 100,000 maintenance of way and shop employees on 28 roads and involves an estimated payroll increase of $25,000,000 annually.

The second petition was received from the Brotherhood of Railway Station Employees, which asked an increase of 15 cents an hour for the employees on the Boston & Albany which the brotherhood represents. The International Brotherhood of Express Teamsters, Chauffeurs, Stablemen and Helpers of North America appealed to the Labor Board on April 27 for wage increases of 10 to 15 cents an hour for 50,000 teamsters, chauffeurs, stablemen and helpers employed by the American Railway Express Company. The Chicago unit of this brotherhood, which is known as the Brotherhood of Railway Express Drivers, Chauffeurs and Conductors, filed its application several months ago for a similar increase. This petition has already received the attention of the board, and the decision is expected to be handed down soon.

The three petitions which have just been filed, with the request of the Order of Railroad Expressmen, which was reported in the *Railway Age* of April 28, make a total of four cases involving wage increases which have been brought before the Labor Board during the recent revival of activity among the railroad brotherhoods. The four cases now pending involve approximately 320,000 employees and annual payroll increases estimated at more than $115,000,000. Although the Labor Board is scheduled to begin a series of hearings on May 14, it is understood that the appeals for wage increases will not be docketed until President Harding appoints successors for the three members whose terms expired on April 15.

Decisions in cases filed with the board by the Order of Railroad Telegraphers against the Chicago Junction and the Toledo, St. Louis & Western, are expected to be delivered

shortly. In the Chicago Junction case, a dispute relating to the negotiation of rules and working conditions governing employees represented by this union is involved. In the Toledo, St. Louis & Western controversy, employees claim that the agreement on rules and working conditions which became effective October 1, 1920, had been illegally abrogated by the road. It is understood that decisions in both cases will be in favor of the union.

The Railroads' Definite Pledge to Shippers and the Public*

By Elisha Lee
Vice-President of the Pennsylvania Railroad

THE OVERWHELMINGLY important fact in the railroad situation as it exists today, is that between now and the close of the present year our railroads will undoubtedly be called upon to perform by far the biggest job in their history. Everything points to a volume of traffic which will materially exceed that of the war-time peaks, the post-war boom of 1920, and the immense movement of last fall. A breakdown of railroad functions under such conditions would be nothing short of a nation-wide catastrophe. But that breakdown is not going to occur. Railroad managers, the employees and the public have too much common sense to permit it. The Pennsylvania reaches a greater variety of territory, climate, commodities and productive activity than any other road. * * * Since the first of the year we have been handling a very much greater movement of all kinds of freight than we have ever transported before in the corresponding months. But for lack of needed facilities, we could have handled a still larger volume of traffic. Since the opening of the year, traffic has been steadily advancing, not by any sudden spurts, but by an impressive growth from week to week. Practically every form of business is operating at top capacity, with no indications of slackening in sight.

In the last 20 years the public service performed by the railroads has more than trebled, but the investment in their plants has barely doubled. At the same time the dollar has been constantly buying less and less. I do not wish to make this talk the occasion for a complaint against our governmental policies, but it is a fact that over-regulation and railroad baiting have been the principal causes for the stunted growth of the transportation systems.

The railroads pledge themselves, before the fall peaks of traffic movement are reached, to wipe out the last remaining vestiges of the shopmen's strike, by reducing the number of cars and locomotives awaiting repairs to normal or better; to increase the average loading per car and the miles per day each car is moved; to finish the storing of coal for railroad use as far as practicable by September, and to so arrange and plan the general scheme of all activities that the use of power and equipment for railroad construction or maintenance purposes shall be reduced to a minimum after September 1. Freight cars are to be practically pooled, when emergencies arise, and their distribution directed by centralized control acting upon the fullest and most complete information as to the needs and requirements of various sections of the country. The railroads have pledged themselves to the fullest compliance with this important and far reaching provision. Campaigns are to be inaugurated among shippers to popularize the slogan, "Do your fall shipping early." That is, do as much of your fall shipping as possible in the summer. Every year many millions of tons of coal are moved to the lake ports and return loads of iron ore are carried to Pittsburgh and other centers. Usually this movement reaches a feverish climax about November. * * * There do not seem to be any insuperable difficulties in the way of spreading out this lake traffic in coal and ore over a longer period. At least the railroads are going to tackle this particular problem on the theory that it can be done. Shippers have already evidenced their desire to co-operate to the fullest extent possible.

Similarly, efforts will be made to secure the co-operation of builders and road contractors.

Although this program requires a large degree of concerted action, the great bulk of the real work must be done by the individual railroads. We are now actively organizing this work on the Pennsylvania. Despite prevailing high prices of materials and labor, the railroads have committed themselves to the task of making up as much as possible, within the present year, of the accumulated deficiency in plant expansion. On the Pennsylvania we expect to do our share. We have actually in sight at the present time over $75,000,000 worth of additional facilities and the total may reach or pass the hundred million dollar mark before the year is out.

Transportation must keep on running swiftly, smoothly and without interruption. Otherwise, American business will feel the emergency brake while at the highest speed ever reached, with the practical certainty of a headlong plunge into the ditch of ruin. Under these conditions the duty of all good and patriotic citizens is plain. Everyone should pitch in and do his part to make the adequate transportation program an unqualified success. The least that could be expected of anyone would be to refrain from throwing a monkey-wrench into the machinery. Yet plans are being openly laid to make the railroads the football of politics with the re-assembling of Congress next fall, and again in the Presidential campaign of 1924.

To speak in plain language, there are men, who, for the sake of the votes necessary to get or hold a political job, would be willing to wreck the railroads at the very moment when the country needs their services as never before. There is no question of intentions. They have been proclaimed openly. Any man who, for the sake of office and power, will play sectional or class prejudices against each other for the purpose of precipitating a breakdown of the railroads at this critical period, is morally, if not in the exact legal sense, guilty of treason against the country. I know that is a strong statement. I have considered it carefully and believe it is fully warranted by the facts.

Here is a situation in which prevention is of the utmost importance, because the trouble, if it comes, will be extremely difficult—perhaps impossible—to cure. There is no greater need in this country than to insure a clean and honorable political deal for the railroads. If they do not get it, the fault will lie with a comparatively few men, who put their personal and local interests above the real welfare of their fellow citizens and their country. The real and effective preventive will be the force of organized public opinion and I, for one, hope and expect, to see that opinion expressed in unmistakable form before any irreparable damage can be precipitated. We need a long holiday in railroad law making. I certainly hope that the patrons of the railroads, who are the ones who will suffer most from errors, will get solidly together and let their wishes regarding these matters be known in a manner which our law makers will respect.

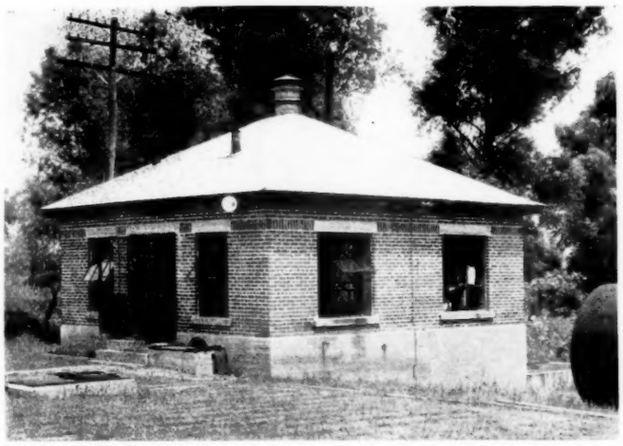
The public is entitled to the cheapest transportation which it is possible to render. Yes, but let us be sure we are talking about the real thing. If it takes a month to get a shipment of steel for building construction from Pittsburgh to Philadelphia, as has happened more than once in recent years, that is not cheap transportation, regardless of rates. It would probably not be cheap transportation if the shipment were hauled free. We should all like to see a lower level of rates if and when that is practical. Whether it will be or not I am not here to predict. Certainly it is not practicable now.

*Abstract of an address before the Philadelphia Association of Credit Men at Philadelphia, Pa., on April 24.

Marked Economies Effected by Water Service

Specialized Organization on Illinois Central Effects Large Savings in Operation

THE ILLINOIS CENTRAL has what is believed to be the oldest water service department of any large road. It is also believed to have departmentalized in this service to a greater extent than any other road. As a result of the concentration on water supply problems which this organization has made possible, economies have been effected in the provision and use of water which have saved large



Standard Pump House of Permanent Construction

sums annually. It has been active in the elimination of water waste and in the reduction of waste in fuel used in water service. It has been progressive in the application of electricity to railway pumping service, in the extensive use of centrifugal pumps and in the selection of other equipment which have promoted economies in construction and in operation.

The Illinois Central-Yazoo & Mississippi Valley system comprises a total of 6,180 miles of lines. It handled a freight traffic exceeding 17,000,000,000 ton miles in 1922, which, together with other traffic, required the expenditure for water service of $1,049,810 chargeable to operation and maintenance and $325,000 for additions and betterments.

To handle this traffic, the road operates about 1,800 locomotives. In 1919, these locomotives used 11,560,554,000 gal. of water. In addition, 859,210,000 gal. was required for stationary boilers and 3,202,510,000 gal. for other purposes, making a total of 15,622,274,000 gal. pumped.

The Details of the Organization

The general plan of organization of this department is illustrated in the diagram. At the head of the department is the superintendent of water service, reporting jointly to the chief engineer and the engineer maintenance of way. On his staff there are, aside from a chief clerk and a stenographer, two inspectors, and the foremen of the system water supply gangs, which it is a practice of the company constantly to maintain. Two chemists also work in conjunction with the superintendent of water service although they report directly to the engineer of tests.

On each operating division, a supervisor of water service reports directly to the division maintenance officer (who on the Illinois Central is an engineer carrying the title of roadmaster) and indirectly also to the superintendent of water service. This supervisor of water service directs the work of the repair men, the pumpers, the treating plant attendants and the foremen of the division water supply gangs.

The authority of the superintendent of water service extends to all matters pertaining to water service of whatever nature. He checks and approves all estimates made for water service expenditures from any source and either makes or approves all recommendations before work is authorized. Where designs are required the details are worked out by the engineering department and approved by the water department. Where work is done under contract, all bids are handled by the department and the work is carried out under the supervision of the department, either through the agency of a special inspector carried on the payroll of the superintendent of water service or by the regular inspectors. In addition all maintenance work is carried on under the supervision of the department, usually under the immediate direction of the division supervisor, and all requisitions for material required for water service other than the incidental repairs supplied by the division stores, are secured upon requisition of the superintendent of water service.

It is the duty of the two inspectors to maintain general supervision over all phases of water supply work, including

A Standard Layout with Water Column at the Track and Storage Tank at a Distance

the program of new work, as well as the operation and maintenance of existing facilities. They also act on special assignments, such as directing the movement of water trains when hauling water to replenish exhausted supplies. While they are qualified to do so, the inspectors make no chemical analyses of the water incident to treating plant operation, as this work comes under the jurisdiction of the chemists. As an important item of their work, however, these officers make a practice of inspecting all water stations periodically in conjunction with the division officers and reporting in detail on a printed form prepared for the purpose, the condition of the facilities and equipment with their recommendations for repairs and their estimated cost. These reports, submitted to the superintendent of water service, form the basis of all

budgets governing the monthly expenditures for water supply work of whatever kind during the following year.

The responsibility for the proper treatment of all water subjected to chemical process rests with the chemists who are carried on the mechanical department payrolls. At the present time two chemists follow the water supply work, one spending the greater amount of his time in the laboratory, and the other traveling on the road. It is the duty of these chemists to make analyses of all water desired and to check periodically the work of the treating plant operators, each of whom is provided with testing apparatus for making a daily test of the conditions of the water in order to regulate the amount of chemicals. These chemists submit carbon copies of their reports to the superintendent of water service, giving the analyses of the raw and treated waters, the chemical dosage used in treating the water and other observations. In addition to this report the superintendent of water service receives records of all analyses of untreated water made in the laboratory for one purpose or another.

The division supervisors of water service have charge of division gang foremen, repair men and pumpers. They are responsible for the maintenance and operation of pumping machinery, tanks, fire hydrants, etc., in their territories. If the work is within the scope and resources of the division forces, the supervisor undertakes it alone, whereas if assistance is required from outside, either because of the nature of the work or its urgency, he again communicates directly with the superintendent of the department. The supervisor is responsible for keeping the stations stocked with supplies and the treating plants with chemicals, the latter usually being provided for on the basis of a 30-day run. In addition to this, he must examine and submit a report to the superintendent of water service quarterly on the condition of all water tanks.

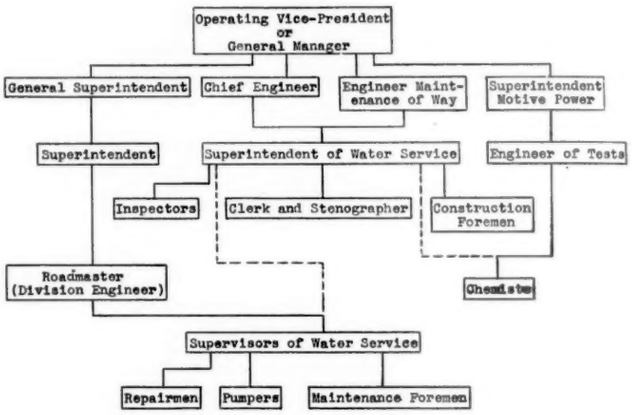
It is the practice of the Illinois Central to maintain system water service gangs, the number of which varies somewhat, according to the amount of work on hand. At the present time there are four outfits, two of which are well outfits, while two are organized for general service. One of the well gangs is engaged largely in making repairs to existing wells, cleaning shafts, renewing strainers, etc. The other outfit is specially equipped and is regularly employed for foundation work and gravel pit development, the water service department being called on to do all exploring work at such points. The other two gangs are equipped for any kind of water supply work.

By keeping these gangs intact, the water department has skilled men constantly available for special work. No difficulty has been encountered in keeping these gangs profitably engaged and they have aided greatly in handling emergency work by reason both of their familiarity with the work involved and the readiness with which they can be assembled and shipped to the trouble area.

In addition to the organization within the department, a standing committee on water service was organized in 1917 to handle problems which affected two or more departments jointly and to harmonize their viewpoints and to co-ordinate their activities in matters relating to water service. This committee consists of the superintendent of water service as chairman, the general boiler inspector and the engineer of tests. As an example of the business transacted, the committee at its last meeting discussed boiler compound with reference to its continued use on a certain engine district and studied the question of either using a boiler compound or building treating plants on another section. At the same meeting it determined whether to use a non-scaling but a foaming producing water obtained at one station in preference to a scale forming but non-foaming water which was also available at that point. These meetings have eliminated much correspondence, have contributed substantially to the dispatch of work, the undertaking or success of which requires agreement of all parties, and have had the additional and important effect of avoiding controversies common to that condition of affairs where one department exercises its jurisdiction without first having arrived at a proper understanding with a department affected.

Special Measures

The work of the department which stands out most prominently is that of preventing water waste, close attention to this phase of the work having enabled the department to show a saving of a half million dollars in seven years or more than four times the entire expenditure incurred for the department. The interest in this phase of water supply began in a small way in 1914 and, like numerous other economies affected by the department, it is directly traceable



A Diagram of the Water Service Organization

to the practice of compiling handy statistical information. The water supply at 96 of the 324 stations is obtained from municipalities at which the consumption amounted to 3,614,512,000 gal. in 1919. These supplies are metered and paid for on bills issued monthly by these municipalities, showing the consumption and charges.

During seven years a reduction of approximately $170,000 was effected in the bills at 14 of these stations, which supplied about 70 per cent of the total amount of city water purchased. During this period the traffic increased 6,026,455,714 ton miles, or about 24 per cent as compared with 1914. On the assumption that the increased demand for water is at least one-half of the percentage of increased tonnage, it was estimated that the increased consumption at the above 14 stations during the seven-year period was equivalent to at least 2,171,696,688 gal., representing a cost of approximately $127,000, which, added to the saving of $170,000, gives a total known saving of $297,000. With this figure as a basis, it was estimated that the total saving in the cost of furnishing water alone during this period amounted to approximately $500,000 for the entire system, a saving which was brought about without any expenditure and without restricting the legitimate use of water.

The methods which were adopted and are still pursued in preventing water waste are not confined to the vigilance exercised by the department forces themselves. Much reliance is placed upon the effect of educational work directed to the end of impressing the significance of water waste upon everybody having occasion to use water. This educational work is done by personal contact, by literature periodically prepared in the form of letters, articles published in the employees' magazine and campaign posters. The most recent development along this line is a stamp which is impressed upon all inter-departmental correspondence.

Since the water waste prevention work was begun, similar studies have been made in other directions. Among these

the consumption of coal by the department has received careful attention. With 158 of its water stations using steam power, the coal bill regularly constituted a large item of the department's annual operating expenditures. The accounting records for 1917 disclosed an 8,000-ton, or 20 per cent, increase in consumption and about a $35,000, or 90 per cent, increase in the cost of coal over the figures of the previous year, and a still further increase for 1918. As these increases did not appear to be justified, the use of coal was made the subject of an investigation, which showed that for some time it had been the habit of the divisions when having surplus coal on hand to unload as much as 10 months' supply at the pumping stations with no thought to the susceptibility of the screenings to deterioration, and that actually in

A Stamp Placed on All Correspondence to Emphasize the Importance of Water Conservation

the fall of 1917 and 1918 large quantities of screenings were dumped at stations much of which deteriorated from exposure to such an extent that it could not be used. The investigation also disclosed the fact that inferior grades of coal had been used at some stations, necessitating the use of from 40 to 60 per cent more of it.

To correct the conditions, orders were issued forbidding the storing of more than a three months' supply at any plant and more attention was given to the selection of coal and to the possibility of profiting by watching market trends. Also at many places power plant improvements were made, among which was the application of more suitable grate bars for burning the finer coal and chief among which was the installation at the larger plants of feed water heaters, of which there are now 35 or 40 in service. These feed water heaters, by utilizing the exhaust steam from boilers for pre-heating the feed water, are estimated to save at least ten per cent in the fuel bills at the stations equipped.

As a partial result of these studies, at least, the consumption of coal dropped from 50,072 tons in 1918 (the year in which the fuel saving campaign was undertaken) to 40,850 tons in 1919, or about 22 per cent, and the cost dropped from $115,289 to $110,710, representing an actual saving of about $5,000, in spite of the fact that the price of coal per ton was 50 per cent higher in 1919 than in 1918. The consumption increased in 1920, dropped to the low figure of 37,498 tons in 1921 and again increased to 40,917 tons in 1922. This figure, however, is still less by about 10,000 tons, or 20 per cent, than the consumption in 1918, in spite of the fact that since 1921 alone, traffic had increased about 30 per cent. If as much coal had been used in 1922 as was used in 1918, the coal bill would have been about $94,000 higher than it was. This estimate disregards any increase that resulted from the substantial increase in traffic.

While the Illinois Central is more fortunate than some roads with respect to the quality of its water, it has long given careful attention to the selection of suitable supplies and to the treatment of those which are suitable otherwise. As a result, 34 treating plants are now in operation and this number will be increased to 40 during the current year. In general, it has been the policy to proceed to treat the worst water first with a view at the same time to equipping entire engine districts to secure the increased benefits of a uniform grade of water. As far as results are concerned, in treating 1,130,591,000 gal. of water in 1921 the 20 plants that were then in operation, representing an investment of $247,801, removed 2,423,900 lb. of scale forming matter from the water treated, which, on the basis of findings made by the American Railway Engineering Association, represents a net saving to the company of $220,100, or over 90 per cent on the investment in these facilities. This saving is limited to the value of reductions effected in the amount of fuel required by locomotives, the flue renewals, the amount of flue calking and other running repairs and the time lost by locomotives while undergoing repairs attributable to water. No figures are available as to the value of water treatment from the standpoint of improved train operation, except perhaps the statement that the average performance of power during the last five years has been over 1,000,000 engine miles per failure in treated water territory, a performance considerably greater than that characterizing the period prior to the establishment of water treating facilities at the points of the worst water. The beneficial effect of the water improvement work from this standpoint is also indicated by the fact that, prior to the establishing of the first treating facility on the Minnesota division, it was necessary to keep one engine in reserve to protect live stock shipments, owing to the unreliability of the service by reason of bad water conditions.

In the early days of the department the work was principally that of removing the uncertainty that existed about getting water because of unexpected failures in the equipment or lack of adequate supplies. With the rapid increase in traffic that has taken place, this has continued to be a principal outlet for the department's usefulness. Only recently the department had occasion to undertake one of its largest projects of this character in the vicinity of the coal fields of southern Illinois, where a shortage over an entire district was solved satisfactorily at a cost of only $240,000 and a supply of improved quality obtained sufficient to provide a considerable source of revenue through the sale of water to the mines and to other roads.

As a further precaution to protect the water supply from failure at any time, each supervisor of water service has been required in recent years to make an examination and report every three months on all water tanks on his division. This practice was instituted following an epidemic of tank failures and it is significant that during the 10 years since this practice was adopted, there have been no tank failures nor any interruptions to traffic arising from this source.

Records over a period of years having shown an unexpectedly large proportion of failures and losses in water supply equipment as being attributable to fires, considerable attention has also been given to fire prevention work. During a 10-year period preceding 1918 the pump house fire losses exceeded $33,000, in addition to those arising from interruptions to traffic caused by failure of the water supply because of fire. That efforts in this direction have been successful is indicated by the fact that fire losses have been reduced over 60 per cent since starting this campaign.

As another method of forestalling failures in equipment and insuring reliable service from the water supply, it has become the practice of the department to install duplicate pumping units in all important points. The arrangements include a duplication of the power unit as well as the pumping unit and the making of provisions for the operation of

one unit independently of the other. At the present time between 50 and 60 stations are equipped in this manner. While the practice necessitates additional initial expense for equipment, amounting to about a 15 per cent increase in the total cost of the facility, this practice is believed to be justified by the security afforded at the important stations against interruption arising from a breakdown in equipment and the opportunity to make better repairs to equipment without at the same time entailing increased expense for overtime work. At some points there is also the additional advantage of an increased pumping facility to handle temporary overloads that occasionally arise from one reason or another.

Permanency in Construction

One practice which has operated not only to promote reliability of service, but also economy in the operation of the water supply facilities, is that of striving for permanency in the character of all new work under construction. The company's standard pump house, for instance, is of brick construction, invariably built on concrete, provided with concrete floors and fitted with steel doors and sash. The company has gone into the use of creosoted timber tanks extensively for supplies not requiring more than 100,000 gal. storage. The department has also adopted the practice, when providing new or replacing storage tanks, of erecting these tanks a considerable distance from the track and installing water columns for the delivery of water to the locomotive. This construction makes it unnecessary to shift the tank when making track changes and permits the watering of locomotives more rapidly than can safely be done from the tank spout.

It has become the practice of the department also to plan for the future when laying pipe lines, a practice which is supported chiefly because of the permanency of the construction secured at a comparatively small additional expense and the lessened expense required for the operation of the pumping equipment by reason of the lower resistance of the larger pipe used.

Because of the possibilities of reducing the cost of attendance, the largest item of expense in the operation of water supply facilities, close attention has been given to the possibilities of the application of electricity to pumping and to the use of oil engines. At the present time there are 11 electrically operated stations in service and 28 oil stations, some of which have been installed to replace steam or gasoline operated plants which required reconstruction and others to modernize stations which studies, based on man hour and unit cost records, showed were operating so uneconomically as to justify the change. Ordinarily, the department will recommend the remodeling of a station when the change will effect at least a 10 per cent saving. In making these replacements or otherwise remodeling stations, each problem is considered individually in the light of the surrounding circumstances rather than according to any standard requirements as to the power or similar equipment.

As a guide in conducting these studies, the records which are compiled of the man hours of attendance and of overtime have been valuable. These reports, studied in connection with the unit cost of operating pumping stations, as furnished monthly, afford an immediate index of the advisability of making changes. These records are used regularly in connection with the department's work, with the result that substantial reductions have been made in the cost of attendance over the system, the number of man hours having actually decreased from 475,570 in 1920 to 392,284 in 1921, or 18 per cent.

The methods described above have been developed largely under the direction of C. R. Knowles, superintendent of water service of the Illinois Central, reporting to F. L. Thompson, chief engineer, and A. F. Blaess, engineer maintenance of way.

Limited Facilities Retard Railroads

In a letter to G. M. Kearnes of the Kearnes Coal Company, Cincinnati, Ohio, A. R. Smith, vice-president of the Louisville & Nashville, has set forth the factors which have prevented the railroads as a whole from keeping pace with the demands of transportation and shows that vast expenditures are needed to improve the situation. Mr. Smith points out that the present peak of traffic will be a normal load within the next few years and that the main difficulty will still be lack of second, third and fourth tracks in the main arteries of transportation, increased yards and interchange facilities. He cites the conditions at Cincinnati as typical of those at many points and supports his statement by a recital of the improvements being made and planned by the Louisville & Nashville. He said in part:

"It is obvious that the railroad systems of the country, as a whole (and particularly those east of the Missouri river) have about reached the limit of their capacity. In the last six months they have been handling the greatest volume of tonnage in their history and although this volume is considered a peak load in these immediate times, the growth of the country in the past clearly points out that about the same volume will be a normal load for rail carriers within the next few years.

"It is to the interest of all that the transportation system be improved and enlarged to a point where it can reasonably keep up with the country's trade and transportation requirements. I think there is not an important railroad line east of the Missouri river which does not need to expend vast sums for additions, betterments and improvements, to be put into existence just as fast as the money can be raised and expended judiciously.

"Most shippers, I find, are inclined to view the difficulties they are encountering more as one of car and engine shortage than anything else. Practically, such exist, but the main trouble today is lack of second, third and fourth tracks in the main arteries of transportation, greatly increased yards and more facile interchange facilities. On the Louisville & Nashville, we are at a point today where, if we had several thousand more cars and several dozen more locomotives, we would not be able to give better service than at present. Furthermore, if the Louisville & Nashville were to double-track its lines from the extremes of the coal fields, and put the heaviest kinds of locomotives in service thereon, and enlarge the yards at the terminals, it would not be in position to handle appreciably more tonnage.

"Our first limitation is in connection with the interchange at Cincinnati which is the 'neck of the funnel,' so far as the Louisville & Nashville and the two other southern lines are concerned. But, even with the limitation remedied, unless the northern lines add to their main lines, enlarge their own yards and improve their own interchange facilities with more distant connections, they cannot take any more tonnage from us than they are now accepting. Today, the Columbus, Toledo and Detroit gateways are blocked, and those gateways have had to handle more freight than I believe they are capable of handling satisfactorily.

Congestion at Cincinnati

"The Louisville & Nashville has a capacity today to deliver an average daily aggregate of about 1,100 or 1,200 loads to Cincinnati connections without any undue difficulty (our record is something like 1,734). Our connections, latterly, have been holding us down to a point where we could admit to the Decoursey yards only about 500 loads per day. The difference between this figure and that which we have been able to get to the lines of our connections at Cincinnati, is freight which is handled through the Latonia yards. In all, including switch movements, we have been running only about 700 loads a day.

"It must not be forgotten that, under present day conditions, 100 per cent of the source of income from railroad transportation is controlled by other than railroad managements, and from 70 to 75 per cent of the operations are controlled by other than the railroad people. This leaves to us the responsibility of trying to make some money out of the operations and of giving the service that the public has a right to expect. Conditions preceding the war were such that the rail lines virtually could not raise money on equitable terms to keep the transportation machine ahead of the growing requirements of the public, and the managements were always in doubt as to whether they could produce the necessary interest or return on the additional money, even if they could procure the amounts needed. The Transportation Act (which was the first really constructive bit of legislation) gave the railroad managements renewed courage, and has gradually instilled

such confidence in the public as has enabled us to procure money upon more reasonable terms, but not on terms as good as during the decade ending in 1910 or 1912.

"You will remember that certain of great constructive geniuses, in the past, endeavored to show the public that the carriers ought to expend a billion dollars a year in betterments, improvements and additions. Probably they will have to expend greatly in excess of this annually for the next five or more years, but unless they have the proper encouragement from the public and from the federal and state governments, they won't be able to secure this money to expend. Certain newly elected representatives in congress are proposing radical changes in the laws relating to the railroads which are all of a restrictive nature. The farm bloc wants drastic reductions in freight rates, which, had they been in effect in 1922, on agricultural products alone, would have wiped out the aggregate net revenue that the American carriers succeeded in retaining.

$20,000,000 for Equipment

"The Louisville & Nashville will expend in the latter half of this year, something over $20,000,000 for engines and cars and will undertake material improvements in roadway and structures. A double track will be completed from Corbin, Ky., to Acosta, after which we will complete the double tracking of the Kentucky & Valley branch as far as Loyall, Ky. We have plans to gradually complete double tracking of the eastern Kentucky division as far as Hazard and will begin shortly the work of reducing grades, restricting curvature and double tracking the line between Sinks and Winchester at an expenditure of approximately $11,000,000. We have planned a vastly enlarged yard at Louisville and have begun the filling. Improvement work is being undertaken on the line between Louisville and Nashville. We are now at work on the line between New Orleans and Mobile where the immediate expenditure is over $3,000,000 with an aggregate in sight of nearly $10,000,000.

"The total capital expenditure of the Louisville & Nashville railroad that has been made, or authorized to be made, since the end of federal control (March 1, 1920) down to the present time is $79,170,014, consisting roughly of $49,212,879 in equipment, and $29,957,135 in roadways and structures. This amount is low since there have been large sums which have gone into the "betterment" accounts but which have been charged to "operation" and not to capital.

"We need, at Cincinnati, an additional bridge and belt line, with a very large clearing yard and complete separation of freight and passenger tracks within the terminal. Before the war, a rough estimate of $66,000,000 was made as the cost of these improvements to be shared by all the lines interested. I have no doubt but that the same plan, if undertaken now, would pretty nearly double that estimate. But, as I have tried to show, it will not greatly improve matters until similar enterprises are undertaken elsewhere. An improved terminal at Cincinnati and improved lines of the Louisville & Nashville leading from the coal fields to Cincinnati and Louisville, would necessitate, in conjunction, an enlarged capacity on the part of the lines at interest north of the Ohio river.

"Possibly, the information as to the efforts at publicity along the general lines of the present-day situation have not reached your attention, but there is hardly a railroad management which has not been telling what I have said above over and over again, not only to the legislatures and the government, but to the public at large, because it is the public, in the end, who will have to act to safeguard their interests.

"I think that you may rely not merely upon the Louisville & Nashville management, but those of other lines with whom you deal, in being perfectly frank with you in explaining conditions, both immediate and prospective, as may appear to them. If you are not satisfied with what you see in the press, or receive from contact with the subordinate officials, the managing officials will always be glad to tell you of what they find and see, as it is to their interest to do this, because it is you, and others like you, who must be relied upon to see that the owners of the railroad are encouraged to provide the money for the vastly increased facilities that are needed. Public sentiment will, inevitably, reflect in Congress, and the latter must be made to understand that the transportation machine means more to the public at large than any other single interest (including the railroad owners), and must be safeguarded and encouraged."

Virginian to Electrify 134 Miles of Line

$15,000,000 Project Will Permit Road to Handle 9,000-Ton Trains at a Speed of 14 Miles an Hour

THE VIRGINIAN RAILWAY has decided to electrify 134 miles of line, including 215 miles of track, lying between Roanoke, Va., and Mullens, W. Va. The division to be electrified crosses the Allegheny Mountains and includes the 1.979 per cent grade, compensated, from Elmore to Clarks Gap up which eastbound coal must be moved before it starts on its down hill journey to tidewater. The undertaking will involve the expenditure of $15,000,000 and the contract for electric locomotives, power house equipment, transformer stations and other electric apparatus has been awarded to the Westinghouse Electric & Manufacturing Company. This is the largest railroad electrification contract which has ever been placed. The alternating current, single phase system with 11,000 volts on the trolley will be used.

Power for operation of trains will be generated by a 90,000-hp. generating plant to be erected on the New River. This will supply alternating current power at 88,000 volts to a transmission line which will extend from Roanoke to Mullens. This line will parallel the railroad approximately and will, in turn, supply power to sub-stations where it will be stepped down to 11,000 volts for the trolley. Apparatus on the locomotives will still further reduce the voltage and will convert the power to three-phase current for the operation of the traction motors.

A feature of the project will be the use of regenerative braking on down grades. This will greatly assist the control of trains and it is estimated that it will also save 15,000,000-kw. hours of electric energy per year.

The principal reason for electrifying is that greater power can be applied to each train thereby resulting in economy of operation and in increased capacity in this heavy grade district. Three Mallet type locomotives are used to move 5,500-ton trains over the ruling grade at a speed of seven miles an hour. The combined power of the three locomotives is about 7,000 hp. The new electric locomotives will develop 20,000 hp. per train and will haul 9,000-ton trains over the same grade at a speed of 14 miles an hour. The Westinghouse Company has stated that it will be entirely practicable in the future to further increase this power so that 12,000-ton trains can be handled at the same speed.

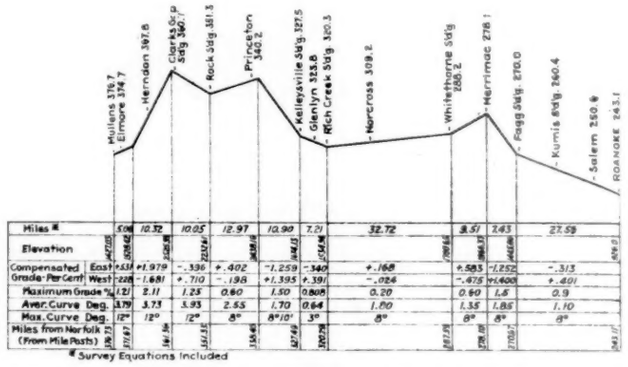
The traffic of the Virginian railway is predominantly bituminous coal; that commodity normally constitutes over nine-tenths of its total tonnage. This coal is secured from the New River and Pocahontas districts, and by far the larger part of it moves eastward to Tidewater at Hampton Roads. The road was built by Henry H. Rogers of the Standard Oil Company, who desired an independent outlet for the extensive coal properties in West Virginia in which he was financially interested. It has a total main line mileage of 442 and its total mileage is 526. It is divided into four operating districts, the eastern three of which are built with grades opposed to eastbound traffic of but 0.2 per cent with the exception of a single short stretch of 0.6 per cent. The three districts mentioned constitute that part of the line from Princeton to Sewells Point, Norfolk, 348 miles, and on this section of the road, the train movement is in effect dropping the trains down hill to Tidewater. The line from

Princeton west to the terminus at Deep Water does not have by any means the same favorable grade line as the other three districts. This district, known as the Deep Water district, is in the coal fields where the traffic originates. The coal tonnage received from mines on the main line or on the Winding Gulf branch is assembled at Elmore which is near the western end of the line included in the electrification project. From Elmore eastbound for a stretch of 11 miles, there is a rise with a compensated grade of 1.979 per cent to the summit of Clarks Gap. This, for many years, was the "neck of the bottle" of the Virginian's operations. A short while ago, however, the management carried out a project of double tracking and tunnel widening which, with the use of heavy power, has relieved the situation very materially. In fact, the situation was changed to the extent that more of a problem was offered to the railroad in moving the trains down the 1.5 per cent descending grade from Princeton east 12 miles to Kellysville. The problem was one of braking the trains and it was largely as a consequence of this situation that the Virginian has been something of a leader in the use of the empty and load brake.

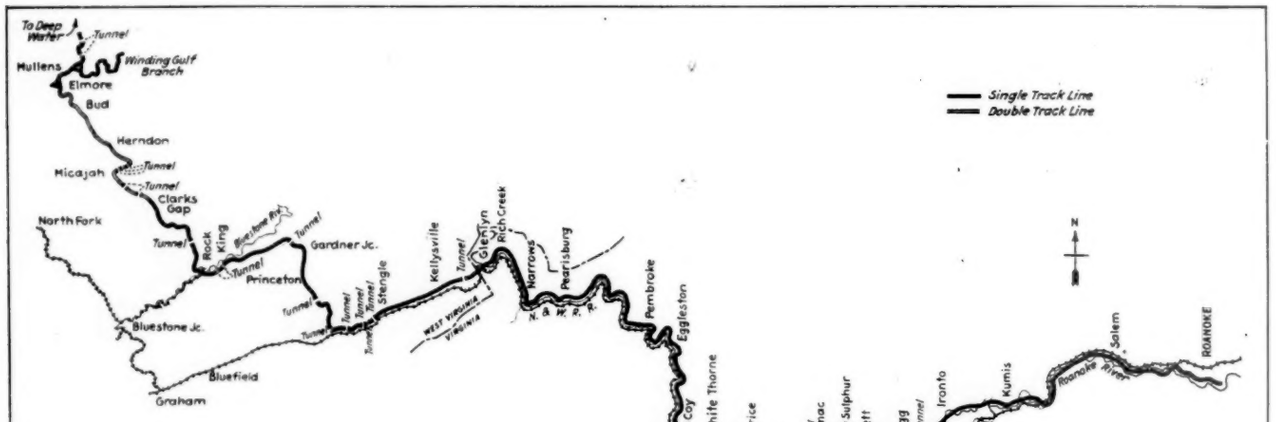
The Virginian, as a part of its program of securing heavy train loads, has resorted to the use of the 120-ton, 6-wheel truck coal car and there are in use on its lines the heaviest steam locomotives in service in the world. The usual method of operation is to handle the train assembled at Elmore up the 1.979 per cent grade to Clarks Gap with three locomotives of the Mallet type. The leading locomotive in the normal method of operation is a Mallet locomotive with tractive effort ranging from 70,800 lb. to 101,300 lb., depending upon the class, with two helpers of the 2-10-10-2 type cut in the train. These locomotives are the largest steam locomotives in service and their size is indicated by the fact that their tractive effort working simple is 176,000 lb. and compound, 147,200. The Virginian has 10 such locomotives. It is the usual procedure to cut the helpers out at Clarks Gap, the train then moving with the single locomotive from there to the end of the division. These details are given because it is this service in which the electric locomotives are to find their place.

The Virginian in recent years has had a very marked expansion in its traffic. The figures for 1922 are not at present available but because of the fact that the Virginian had handled non-union coal, they will, presumably, be the largest thus far in the company's history, this result obtaining because of the heavy traffic handled during the strike of the bituminous miners in the union districts. The expansion in traffic has required the management to carry out a number of important improvements in the property. The double tracking of the line between Elmore and Clarks Gap has already been mentioned. Another was the recent improvement in the yard and terminal facilities at Elmore and the shop facilities at Roanoke and Princeton. The road also has plans for an additional coal dumping pier at Sewells Point where it already has facilities capable of dumping 90 cars per hour when working at capacity. It has gradually been extending its lines in the coal districts, this work including the construction of a subsidiary line termed the Virginian & Western, 15 miles in length, and an extension of the Winding Gulf branch, totaling slightly over two miles. The larger part of the road's present tonnage comes from the New River field; but, the future holds out the possibility of gradually increasing tonnage from the Pocahontas district from which the road already receives considerable traffic. The present electrification project is the latest step in this improvement and extension program.

Electric operation will permit much greater expansion of traffic over the existing track, and regeneration of electric power should greatly simplify the difficult problems to be met, particularly on the 1.5 per cent descending grade east of Princeton. The undertaking is the first large electrification to be instigated since the war and it is expected that electric operation will be started in about 18 months.



Condensed Profile of the Virginian Railway from Mullens, W. Va., to Roanoke, Va.



Map of the Virginian Railway from Mullens, W. Va., to Roanoke, Va.

Santa Fe Earns Common Dividends Twice Over

This Is Outstanding Feature of Property's Operation— $60,000,000 Improvement Program for 1923

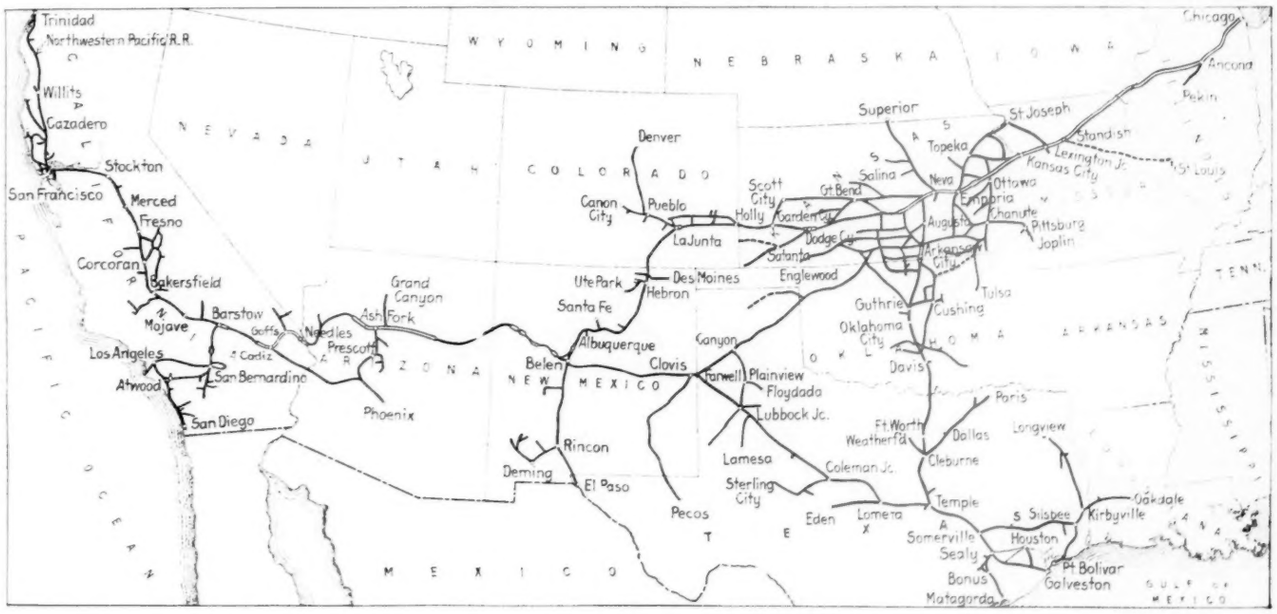
THE ATCHISON, TOPEKA & SANTA FE'S 6 per cent dividends on its common stock totaled in 1922, $13,605,660. The surplus carried to profit and loss after the payment of dividends and certain small appropriations for sinking and other reserve funds totaled $14,455,363. The Santa Fe thus completed another year in which it earned its common dividends twice over. This is something which it has now done consistently enough over a period of years so that it is the sort of result that one normally expects to see in a Santa Fe annual statement of earnings. The Santa Fe has many points of interest to any observer of railway activity. Of these, however, the one of outstanding importance is its consistent earning power and the extremely conservative policy which it has followed with reference to dividend disbursements to its stockholders. The wide margin of earnings which it has built up over and above its dividend requirements has been sufficient so that as of December 31, 1922, the company showed on its balance sheet a profit and loss surplus of $141,534,082. Largs sums of money have been appropriated from earnings for investment in the physical plant. In addition to the profit and loss balance already noted, the company showed in its balance sheet an item of $87,176,565 as additions to property through income and surplus and a total corporate surplus of $89,773,001.

The fact that the Santa Fe has maintained a dividend rate of but 6 per cent while its earnings have been equivalent to twice that amount has been made the topic of much discussion, favorable and otherwise. Some authorities have contended that the stockholders have not received a proper share of the earnings of the property and whether one may agree with this contention or not, the fact remains that it is an idea which is being given increasing attention in financial circles as time goes on. However, the situation is such that a share of Santa Fe stock has much the characteristics of a bond. The observer who studies Santa Fe affairs watches its operations with very different feelings from those with which one observes the earnings statements of a more ordinary property. In what we have termed the ordinary property the earning statements are of much more present importance. The student who follows them does so with the idea of ascertaining such elements as the possibilities of interest payments on the income bonds or dividends on the common or preferred stocks, etc. The difference in this situation from that of the Santa Fe is an extremely wide one.

Pay Less Interest Than in 1908 or 1912

It is further of interest in this connection that the Santa Fe's interest on funded debt in 1922 was $11,871,255 and that this sum besides being less than the dividends on the common stock was less also than the interest charges of many previous years, notably years as far back as 1912 or even 1908. This again is the unusual. A writer in the New York Evening Post some months ago made this very significant statement: "Atchison's bond list is one of the few which may be entered blindly, so far as quality goes, for not a poor security appears in the lot. It would be bold perhaps to claim that Atchison's bonds outrank others of similar type, but they very nearly do. . . . As is usually the case with bonds so adequately secured, however, Atchison's issues sell relatively high."

Besides the fact that the Santa Fe earns a wide margin over its common dividends which it does not make available to its stockholders direct, another outstanding characteristic in Santa Fe operations is the manner in which earnings have been put back in the property with the result that the system is noted for the manner in which it builds ahead of the demands made upon it for transportation. It is of interest at the present time to observe the extensive plans which are under way. The Santa Fe has recently let contracts for approximately $24,000,000 of new equipment, the most im-



The Atchison, Topeka & Santa Fe

portant items included being 7,150 freight cars and 59 new locomotives to be delivered before July 1. It has started work on a new double track bridge over the Mississippi river to cost $4,000,000, this bridge being as President Storey puts it in his annual report "imperatively required" by the density of the traffic over the Chicago, Kansas City line. The other projects include the enlargement of shops, terminals and sidings. Probably the project of outstanding interest, however, is the double track work planned between Albuquerque and the West. This double track work, authorized and undertaken since the beginning of 1922, will cost something like $15,000,000.

$60,000,000 Improvement Program for 1923

President Storey in his annual report estimates that the company's cash expenditures during 1923 for all improvements and equipment will amount to at least $60,000,000. He says: "The improvements have been practically confined to what will increase capacity for handling traffic, other improvements, even though desirable, being deferred, because the present program is all that the company can efficiently handle this year." President Storey gives the idea that these improvements are necessary; he even uses the word "imperative." It is the general opinion, however, that the Santa Fe has a policy of carrying out extensive improvement work of one sort and another earlier than might be the practice on roads less fortunately situated. There is no question that the management is in that fortunate and somewhat unusual position among the rest of the railroads of the country in being able to anticipate its traffic load in much better manner than would be the case on almost any other property.

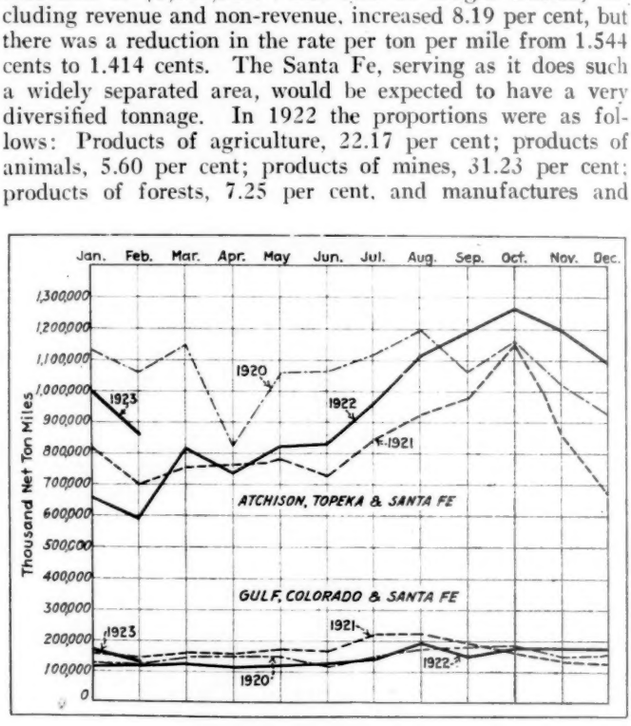
In 1922 the Santa Fe carried more traffic than in 1921. Because of rate reductions, however, its total operating revenues were less. It reduced its operating expenses, the reduction being especially evident in the transportation account. Because of the fact that the reduction in expenses was greater than the reduction in revenues, there was an increase in net operating revenue as between the two years. Net railway operating income or net after rents in 1922 was $40,003,402, this being less than the figure of $41,268,307 in 1921. One of the principal reasons for the decrease was an increase in taxes. In 1921 railway tax accruals totaled $14,836,268 and in 1922 they totaled $18,395,512. Part of the reason for this increase was an item of $2,835,305 in federal taxes on the net credit resulting from the settlement made during the year with the United States Railroad Administration. There was also an increase in state and local taxes. One of the reasons for this was the increased rate in the tax on gross receipts in the state of California. In 1921 the state of California increased its taxes from 5.25 per cent to 7 per cent on gross receipts, this increase applying through part of 1921 but through all of 1922, and the validity of the increase is in dispute in the United States district court.

Optimism Concerning Taxation

President Storey in his annual report has one of the first statements which we have yet seen with reference to taxation which may be said to have a favorable aspect. His statement, therefore, is worth quoting in full and is as follows: "There are indications that the flood tide of public expenditures has passed. In several of the states in which your company operates the taxpayers have come to realize that the programs of public expenditures that they have approved are extravagant and beyond their means and ability. Delinquency in the payment of taxes has reached unusual proportions. In some states the people are insisting so loudly on the reduction of the tax burdens that even road and school programs are being abridged and postponed." The various details given will indicate that taxes in 1923 should presumably be less than they were in 1922.

The net corporate income available for dividends in 1922 was $34,382,371, a reduction from the figure of $39,331,662 in 1921. One of the principal reasons for this reduction besides the lower net operating income was the inclusion in the 1921 statement of $3,175,149, representing accrued compensation under the federal control contract. There was also approximately $1,200,000 more other income in 1921.

The Santa Fe's total operating revenues in 1922 were $225,124,544 as compared with $228,925,070 in 1921, a reduction of $3,800,526. The tons of freight carried, including revenue and non-revenue, increased 8.19 per cent, but there was a reduction in the rate per ton per mile from 1.544 cents to 1.414 cents. The Santa Fe, serving as it does such a widely separated area, would be expected to have a very diversified tonnage. In 1922 the proportions were as follows: Products of agriculture, 22.17 per cent; products of animals, 5.60 per cent; products of mines, 31.23 per cent; products of forests, 7.25 per cent, and manufactures and



Santa Fe Net Ton Miles

Operating statistics of the Atchison, Topeka & Santa Fe System are reported separately for the Atchison, Topeka & Santa Fe itself, for the Gulf, Colorado & Santa Fe, the Panhandle & Santa Fe, etc.

miscellaneous, 29.63 per cent. There were substantial increases in 1922 as compared with 1921 in ores and in refined petroleum and its products. The volume of agricultural products carried showed a decrease as compared with 1921. That year, however, was a record year and the final result was that the 1922 tonnage of products of agriculture, while less than in 1921, was of sufficient volume so that it had been exceeded but twice in the company's history.

Operating expenses in 1922 totaled $166,904,378, comparing with $173,217,915 in 1921, a decrease of $6,313,537. There was a decrease in the maintenance of equipment account amounting to $1,403,008, and a decrease in transportation of $9,161,048. On the other hand, there was an increase of $4,449,119 in maintenance of way expenses, due, it is understood, to the fact that maintenance of way expenses in 1921 were held at a comparatively low figure as a result of the business depression. The sizable reduction in transportation expenses resulted from more economical operation owing to better business conditions. The accounts show a smaller amount paid for wages and marked reductions in the cost of fuel. During the year the company paid $3.81 for each ton of coal as compared with $4.33 in 1921 and fuel oil was obtained at a cost of $7.61 per ton as compared with $10.37 in 1921. The Santa Fe was not appreciably affected by the coal strike in 1922. Coal, in any event, does not constitute a very large proportion of its total tonnage. The effects of the railway shopmen's strike were seen in greater degree although the Santa Fe was less affected by the strike than most of its neighbors. The chart of net ton miles which is given with this article will indicate the great expansion in

traffic which developed during the latter part of the year. It is noteworthy that the figure for the best month of 1920, August, was exceeded in 1922 in October.

Equipment Condition

Some interesting points are evident in the Santa Fe's averages showing equipment condition. The property had a percentage of bad order cars on April 1, 1923, of 8.0 per cent. This figure on July 1, 1922, was 8.4 per cent. It is of interest that on November 15, the percentage had been reduced to 4.9, but has since increased. The percentage of locomotives held for repairs requiring over 24 hours on July 1, 1922, when the railway shop strike began, was at the abnormally low figure of 10.8, and at that time the road had 229 serviceable locomotives stored. The effects of the shop strike and increase in traffic brought the percentage figure up gradually during the latter months of the year so that on December 15, the percentage was 18.6, at which time the number of serviceable locomotives stored had been reduced to 20. On April 1, 1923, the locomotive condition had again been restored to such a favorable state that the percentage held for repairs requiring over 24 hours was only 15.7 and the number of serviceable locomotives stored had been increased to 131. The Santa Fe is one of the few railroads which has made progress in recent months in storing serviceable locomotives. Its total of 131 on April 1 was the highest for any railroad in the country and constituted about one-seventh of the total of 914 on all the railroads of the country.

The Santa Fe's Strength as Estimated by an Observer During the War

When railroad earnings suffered their sharp reduction during the federal control and guaranty periods, some observer made the statement that if it could be imagined that conditions would become so poor as to throw all the railroads of the country into receivership, probably the last railroad to suffer that fate would be the Atchison, Topeka & Santa Fe. It seems legitimate to bring that statement up to date by saying that as the railroads of the country began to realize on the improved conditions of 1923, the Santa Fe should be in the forefront in effecting improvement in its operating results.

President Storey in his annual report observes that because of the quite general distribution of heavy tonnage among the several commodities included in the major groups of traffic which the Santa Fe handles, in connection with the wide territory it serves, there exists a protection against the failure of any particular crop or class of traffic seriously affecting the company's earnings. He says, also, that there has been a substantial revival of business throughout Santa Fe territory, this being especially marked in cotton growing, copper mining, sheep raising, lumber and oil. The Atchison, Topeka & Santa Fe System reported for the first three months of 1923 a net railway operating income of $4,227,454, an increase of $1,538,277 over the figures for the first three months of 1922.

Air Brake Association Meets in Denver

To Develop Tolerances for Triple Repairs; Discuss System of Central Repair of Engine Brakes

A REPRESENTATIVE GATHERING of air brake supervisors and foremen from all sections of the United States and Canada were in attendance at the thirtieth annual convention of the Air Brake Association. The meeting was held at the Albany Hotel, Denver, Col., on May 1, 2 and 3 and was exceptionally well attended by representatives of the western roads.

W. R. Scott Addresses the Convention

The opening session called to order by the president, Mark Purcell, Northern Pacific, was given over to a number of addresses and business reports. W. R. Scott, president of the Southern Pacific, Texas and Louisiana Lines, gave some of the early history of the air brake and told how when he was a member of the Traveling Engineers' Association the air brake discussions early demonstrated the need for a separate organization to devote its entire time to air brake subjects. He paid a tribute to the fertility of invention and the energy of the men who have been instrumental in the development of the air brake, citing a case in which the Westinghouse Air Brake Company had furnished enough empty and load brakes to equip several trains in six weeks after the need for such a brake had been suggested to the officers of the company as a means of facilitating operation on mountain grades of the Southern Pacific.

In speaking of the future of the association, Mr. Scott said that its opportunities for useful service were as great as they have been in the past. One of the things demanding its attention in the future, he said, was the relation of automatic train control to brake operation. The co-ordination of the operation of the train control system with that of the brake system and signal system under the wide variety of conditions encountered on American railroads, he said, presented a phase of the subject not covered by the limited installations so far made and introduced air brake men to a new phase of railway operation. He also expressed the belief that the further development of the light and load brake should be taken up.

Mr. Scott said that he had learned that many of the members in attendance had come on their own time and at their own expense. This he said should not be. The cost to the roads of sending men to the convention he considered infinitely small compared with the value of the work of the association, and he suggested that if the association approached the individual executives, they could be made to see that it would pay them to send their men.

Mr. Scott referred briefly to the program of the executives to provide adequate service to the American people during the current year and said that it had been suggested that he tell the association what it could do to help in carrying out this program. This he said was attacking the problem from the wrong end; the air brake men should tell the executives what measures should be adopted in their field and should formulate their own part in the program.

President Purcell's Address

President Purcell in his address said: "To a large extent the state of economy and efficiency reached in railway transportation in its present stage is due to brake control. Without such control, the number of trains that could be handled over a district in a given time would be very much less because the trains would have to be spaced farther apart and the speed restricted to prevent accidents.

The maintenance and operation of brakes is one of the

most important departments of railway operation. The best methods of organized inspection and repairs are time-savers in getting trains over the road and through terminals. Air brake men are best qualified to recommend what practices should be followed and now that a greater shortage of equipment is threatened than was ever experienced before in the history of the railroads, there is an opportunity for the air brake men of the country to be of great assistance to the roads in getting the most service out of the equipment available by facilitating more rapid movement of cars and increased mileage with less time on the repair tracks.

"The Air Brake Association has acquired a degree of authority such that it is being consulted with respect to brake matters and train operation more than in the past. This points to the need of exercising the greatest care when recommending or endorsing measures that action be not too hasty, but that they be carefully investigated and fully discussed in all their bearings before action is taken."

S. G. Down Compares American Railways and Those in Foreign Countries

S. G. Down, vice-president of the Westinghouse Air Brake Company, who has during the past few years observed railroad performance in most civilized countries, said that none of the government-controlled roads with which he has come in contact can compare in efficiency with American railroads. Those who are so ready to attack railway management in this country, he said, ought to have to get along with the transportation conditions prevailing where the roads are operated by the governments.

One of the great advantages of the railroads in North America as compared with continental Europe is the universal interchange of equipment. In Europe, he said, one of the greatest difficulties in the way of interchange is the number of types of brake equipment employed in the different countries which will not operate synchronously with each other. He stated that in North America there is an investment of five hundred million dollars in brake equipment, all of which operates interchangeably. The magnitude of this investment he cited to show the importance of keeping on firm ground as to fundamentals and not introducing any changes that will interfere with the universal interchange of cars.

Tolerances for Air Brake Repairs

C. B. Miles, representing the St. Louis Air Brake Club, presented a paper in which he pointed out the lack of uniformity in methods of repairing air brake apparatus. Referring particularly to triple valves, he pointed out the many makeshift devices developed in various shops to take care of this work, many of which could not turn out work with a sufficient degree of accuracy to insure adequate service from the repaired parts.

The paper was presented for the purpose of bringing to the attention of the association the need for the development of standard tolerances for condemning parts and to which the equipment should be restored after it has been repaired. After considerable discussion of the advisability of the railroads attempting to make certain repairs in their own shops and of the making of repairs at local points, or at central repair points, a motion was adopted that a committee be appointed to investigate and recommend tolerances for triple valve repairs.

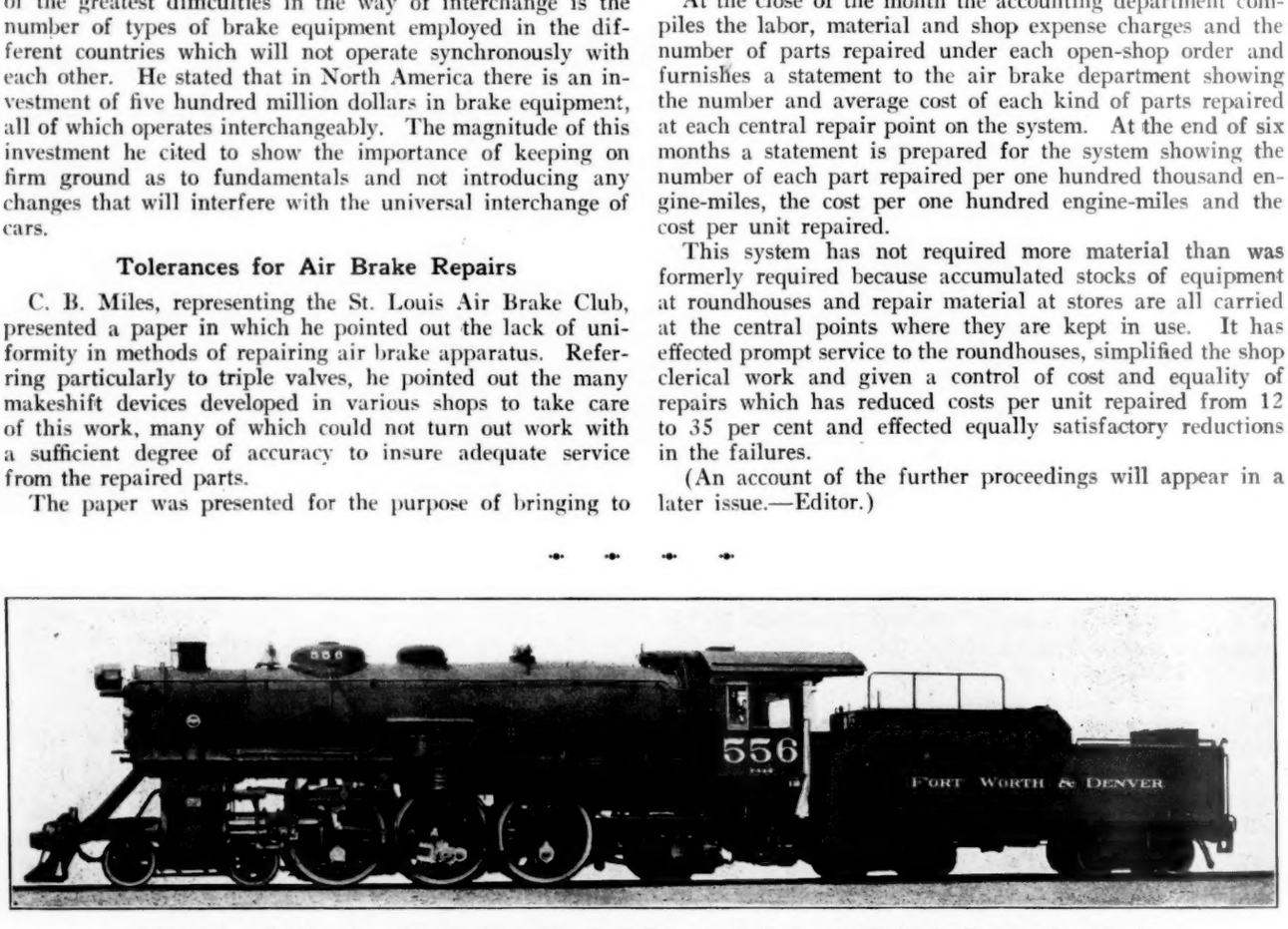
Service Records and Maintenance Costs

A paper was read by W. H. Clegg, air brake supervisor, Canadian National, describing the method by which all, except the lightest, of running repairs to locomotive air brake equipment are handled at central repair points. The essential features of the system are a standard practice card setting forth just what work is permitted to be done at the enginehouse. A standard material list in the stores department setting forth what material the store may furnish on requisition and a series of open-shop orders at each central repair point, each of which covers all of the parts of a certain kind repaired during the month. Under the open-shop order system when a pump governor or a feed valve, a pump, etc., requires repair, it is removed and turned in at the local store with a requisition for a repaired piece of equipment which is charged out at the average cost of repairs during the preceding month. The defective part is then sent to the store at the central repair point with a requisition for repairs. The receiving store then forwards a repaired part to the outlying store and delivers the defective part to the air brake shop, receiving a receipt for it. When repaired, the part is returned to the store which gives the foreman a receipt for it and places it in stock.

At the close of the month the accounting department compiles the labor, material and shop expense charges and the number of parts repaired under each open-shop order and furnishes a statement to the air brake department showing the number and average cost of each kind of parts repaired at each central repair point on the system. At the end of six months a statement is prepared for the system showing the number of each part repaired per one hundred thousand engine-miles, the cost per one hundred engine-miles and the cost per unit repaired.

This system has not required more material than was formerly required because accumulated stocks of equipment at roundhouses and repair material at stores are all carried at the central points where they are kept in use. It has effected prompt service to the roundhouses, simplified the shop clerical work and given a control of cost and equality of repairs which has reduced costs per unit repaired from 12 to 35 per cent and effected equally satisfactory reductions in the failures.

(An account of the further proceedings will appear in a later issue.—Editor.)



Oil-Burning Pacific Type for the Fort Worth & Denver, Built by the Baldwin Locomotive Works

The Railroads' Interest in Standardization

Some Reasons Why They Should Co-operate with the American Engineering Standards Committee

By Albert W. Whitney
Chairman, American Engineering Standards Committee

NOTHING NEEDS TO BE SAID to the railroads about standardization in general for they are fully alive to the importance of standardization and the work that they have done in this field is not only of the highest quality but it stretches back into a period far antedating the formation of the American Engineering Standards Committee. The American Engineering Standards Committee is not so presumptuous as to preach standardization to the railroads; it does, however, preach co-operative standardization, that is, a national standardization in which all interests are represented.

The A. E. S. C. does not agree with the attitude that "railroad standards are a matter of no concern to anyone but the railroads. The railroads will get together and decide what they want and then all that the manufacturers need to do is to manufacture along these lines." This is not quoted as typical of railroad opinion; nevertheless it expresses a point of view that is not uncommon. The A. E. S. C. was founded on a belief that is exactly contrary to this, namely, that in the process of standardization all interests must be brought together.

The American Engineering Standards Committee was founded four years ago by five of the engineering societies to act as a clearing-house for engineering and technical standards; its function is to encourage standardization and specifically to furnish a forum where all interests may meet and establish standards so representative and authoritative as to be worthy of being called national.

Its first year was spent in making such internal adjustments as were necessary before the various interests could be brought to look at the problem in essentially the same way; the second year was largely spent in securing the wholehearted co-operation of the Government and of industry itself. The third and fourth years, however, have been years of substantial material accomplishment and today the need for this kind of work can be discussed not merely as a matter of theory but in the light of actual results. The present membership is as follows:

American Electric Railway Association.
American Institute of Architects.
American Institute of Electrical Engineers.
American Institute of Mining and Metallurgical Engineers.
American Railway Association (Engineering Division).
American Society of Civil Engineers.
American Society of Mechanical Engineers.
American Society for Testing Materials.
Association of American Steel Manufacturers.

Electrical Manufacturers Council:
- Electrical Manufacturers Club.
- Electric Power Club.
- Associated Manufacturers of Electrical Supplies.

Electric Light and Power Group:
- Association of Edison Illuminating Companies.
- National Electric Light Association.

Fire Protection Group:
- Associated Factory Mutual Fire Insurance Companies.
- National Board of Fire Underwriters.
- National Fire Protection Association.
- Underwriters' Laboratories.

Gas Group:
- American Gas Association.
- Compressed Gas Manufacturers' Association.
- International Acetylene Association.

National Association of Manufacturers of the U. S. A.

The Panama Canal.

Safety Group:
- National Safety Council.
- National Bureau of Casualty and Surety Underwriters.
- Society of Automotive Engineers.
- U. S. Department of Agriculture.
- U. S. Department of Commerce.
- U. S. Department of the Interior.
- U. S. Department of Labor.
- U. S. Navy Department.
- U. S. War Department.

Probably the most significant statement that can be made about the procedure of the A. E. S. C. with regard to the two things that it particularly does *not* do:

1—It does not initiate standardization work.
2—It does not do standardization work.

It encourages standardization but the initiation of projects must be from outside; it provides facilities and procedure for doing standardization work but the work itself is not done by the A. E. S. C. but directly by the organizations that are concerned with the standards; in other words, the A. E. S. C. is definitely a clearing-house and not a standard-creating body.

A Particular Project

The way that the A. E. S. C. operates can best be understood by tracing the history of a particular project in detail. Let me take an actual case. The International Traffic Officers Association and the Illuminating Engineering Society made a joint request to the A. E. S. C. that a conference be called to consider the preparation of a code with regard to colors for traffic signals. The chairman, after securing the support of the executive committee, called such a conference.

Such a request may be made by any responsible representative and interested body. All representative bodies that are known to have an interest in the subject under discussion are invited to such a conference and the proceedings are entirely under the control of those who have assembled and are conducted in a democratic way. In the particular case of colors for traffic signals 40 organizations were invited and about 100 individuals were in attendance.

Such a conference may decide that it is unwise either in general or at the present time to start standardization work in this particular field or it may decide that work should be begun at once. The latter decision will presumably take the form of a resolution recommending to the A. E. S. C. that it take the necessary steps. This resolution may or may not include a recommendation with regard to sponsorship.

The sponsor (or sponsors, for there may be several of them) is simply an interested body, designated by the A. E. S. C. but not necessarily a member of the A. E. S. C., that will agree to undertake the executive work and the incidental expense necessary to carrying on the actual preparation of the standard in question. In the case of the code for colors of traffic signals the National Safety Council, the Bureau of Standards and the American Association of State Highway Officials were designated as sponsors; the work is well under way.

The first work of the sponsor is the formation of a "sectional committee." This committee is the actual working committee that does the technical work of preparing the standard. It is the sectional committee rather than the sponsor that is the important element in the making of a standard. The

sectional committee is made up of representatives designated by the various bodies interested in the particular project in hand. It is not a committee of the A. E. S. C.; the A. E. S. C., however, is called upon, as an important part of its duties, to approve the personnel of the sectional committee; the committee must be thoroughly representative and properly balanced.

After the code has been completed by the sectional committee it is referred for approval to the A. E. S. C. It will not be so referred unless it has already received the substantially unanimous approval of the sectional committee. Again the A. E. S. C. does not pass upon the technical aspects of the code but upon the question of whether the work was carried on in a democratic and representative manner. Approval means that the A. E. S. C. has satisfied itself that all organizations concerned have had an opportunity to participate in the work, that the work has been carried out under a procedure that has been regular, open, and above board, and that the standard represents a real national consensus on what is best in American engineering and industrial practice, and hence that it either already does or may reasonably be expected to play a significant role in the industry concerned. If the code is approved, it becomes known as an "American Standard" or a "Tentative American Standard" as the case may be; and while there is nothing mandatory about such a code the standing of the A. E. S. C. is sufficient to bring it into very general use in most cases.

The existence, when the A. E. S. C. was formed, of certain standards that had been in actual use on a national scale for years made it necessary to provide during a limited period for the approval of such standards without the formality of going through a sectional committee. Such standards to be approved must have been evolved in substantial accordance with the procedure in the case of new projects or they must have been in use over a period of years as recognized national standards. This provision, which was designed to be only temporary, lapses on January 1, 1924, and after that time all standards must go through a sectional committee.

At the present time there are 126 projects under way of which 35 are approved standards. A total of 205 national organizations and 25 state organizations are represented on sectional committees by about 1,000 individuals.

Important Relations With the Government

The A. E. S. C. has important relations with the government; not only are seven government departments included in its membership but it has intimate relations with the Bureau of Standards, the Division of Simplified Practice and the Federal Specifications Board. In the latter case, for instance, there is a reciprocal arrangement by which the A. E. S. C. serves as a clearing-house for bringing about uniformity between government specifications and the standards of industry.

National standardizing bodies similar to the A. E. S. C. now exist in 14 foreign countries. The A. E. S. C. maintains connections with these and is the chief source of information in this country with regard to foreign standards as well as with regard to domestic standards.

The Railway's Interest

Making a knowledge of the standards of foreign countries available to manufacturers in this country, making American standards known in foreign countries, and developing international standardization are all important factors in the development of export trade, a matter in which the railroads of the country certainly have a considerable interest, both direct and indirect. The American Engineering Standards Committee is fitted to handle all three of these problems effectively; in fact the cultivation of these fields was an important consideration in starting the A. E. S. C.

With this as a background the fundamental question may be discussed of whether there is need for such a national organization or whether a large interest such as the railroads can carry on its standardization work independently. Can an interest stand by itself or are the relationships between interests so intertwined as to make that impossible? The pragmatic fact is interesting in this connection that we found it necessary on practically all sectional committees to include as many as 20 members if the committee was to be made thoroughly representative of the interests concerned.

The case for independence of action is probably as strong in the case of the railroads as in any other field. Here is an enormous industry in which the needs are quite uniform; here if anywhere is an industry which should be able to take care of itself. The fact is, however, that, in practically all cases, even those that seem simple, other important interests are found to exist; failure to bring them in must inevitably result in a loss of efficiency and economy.

There is a particular instance in hand in which we are at the present time seeking to obtain the co-operation of the railroads. It has to do with specifications for railroad forgings. Here is a case which at first sight seems to be one which the railroads should handle alone. But we find that the same manufacturers who are making these forgings for steam railroads are also making similar forgings for electric railroads and that a very large part of their business is for export trade. Here then immediately are the requirements of four interests that need to be harmonized: 1—the requirements of the steam railroads, 2—the requirements of the electric railroads, 3—the requirements of the export trade, 4—the requirements of the manufacturers.

If the requirements of the electric railways and of the export trade are not harmonized with those of the steam railroads, it will be necessary for the manufacturer to work to three specifications. This is manifestly a source of expense which is certainly unnecessary if the requirements are capable of harmonization and which can fall only upon the consumers, namely, the railroads. If the requirements of the manufacturer as to economy of manufacture are not taken into account he may be put to unnecessary expense. I have in mind a case where an unessential detail in a railroad specification required the designing of a new machine equipment at an expense of some thousands of dollars.

I am ready to admit that the railroads are big enough and intelligent enough to carry on their standardization work by themselves but this self-sufficiency can be had only at the sacrifice of efficiency and economies which the public has a right to expect. As a social matter, therefore, the problem transcends the railroad field and requires the good offices of some co-ordinating agency such as the A. E. S. C.

Independence in Standardization at Sacrifice of Economy

Our experience indicates that there can be no such thing as independence in the field of standardization except at the sacrifice of economy; and reasonable economy is something that the public has a right to insist upon for it is the public that pays the bills.

It should be said, however, that the A. E. S. C. has no means of forcing co-operation. In a case where the interests affected are relatively simple and where the principal interest refuses to co-operate the project would undoubtedly have to be abandoned. In other cases where there are several important interests a failure to co-operate by one of the interests might not prevent action altogether, unfortunate as it might be to proceed under such circumstances.

I am free to admit that such standardization as we advocate has its drawbacks. Co-operation must necessarily involve sacrifice for it is impossible for a variety of interests to harmonize all their differences without making some concessions.

This can be said, however, that such concessions are not

nearly so serious as might be expected. This depends upon a very fundamental principle which lies at the bottom of all co-operation, namely, that the various interests fundamentally concerned in any project are not really antagonistic. There is a solution of every problem and this will be not only best for the public but best in the long run for the various interests that are concerned. So that the problem is primarily not one of give and take but of working together to discover this best thing on which all can unite. In this connection I might say that not the least of the benefits that the A. E. S. C. brings to its members and co-operating bodies is the mutual understanding and resultant identification of interests that comes from association.

Now to come down specifically to the case of co-operation from the railroads. We sincerely believe that the railroads need the A. E. S. C. and we know that the A. E. S. C. needs the A. R. A. As a matter of fact, the A. R. A. is represented on 28 projects that are now under way and the A. R. E. A. on 18. Furthermore, the A. R. A. has one member on the main committee; it is entitled to three members; it should have them. Mr. Frink is doing good work for the A. R. A. but other branches should be represented as well as the Engineering division. The A. E. S. C. needs the co-operation of the railroads, first, because it is embarrassing to carry on national standardization work without the full co-operation on its committees of such an important interest and, second, because of the moral effect of having the railroads thoroughly in sympathy with the work.

Up to the present time the A. E. S. C. has been supported (aside from some casual gifts) by the dues of its members. This is not sufficient for the work that needs to be done. It has a staff of 12 people but this should be doubled to take care of even present needs. It has, therefore, developed a plan for sustaining membership by which industry can subscribe directly. Sustaining members will have no share in the conduct of the A. E. S. C. but will receive a bulletin service as well as the more general benefits that will accrue to industry from its work. An alternative basis of contributions is provided, either (1)—approximately one per cent per thousand dollars of gross annual income or (2)—a cent and a half per thousand dollars of the market value of corporate securities outstanding.

The question of sustaining membership is, however, entirely distinct from that of regular membership for which the dues are a flat $500. It is hoped that many of the railroads will want to subscribe to the support of the A. E. S. C. directly by becoming sustaining members, but this is a quite different question from that of membership by the A. R. A.

There are three ways in which the co-operation of the railroads is possible and welcome. First the railroads may co-operate as they are now doing to a very considerable extent, although not quite as thoroughly as we could desire, by serving, as representatives of the A. R. A. or other similar organizations, upon sectional committees and upon certain special committees of the A. E. S. C. This is a most valuable relationship for the A. E. S. C. and we believe equally so for the railroads and can be entered into without expense to the railroads. An association that is represented upon sectional committees is called a "co-operating body."

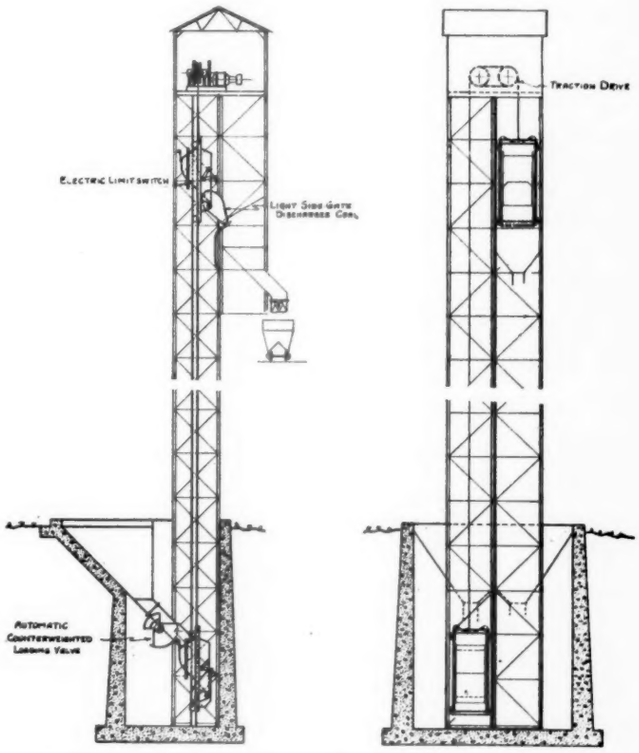
Second, the A. R. A. and other similar organizations are eligible to become member-bodies. The A. R. A. is at present a member body with one representative and paying dues of $500. This is an inadequate representation and an inadequate subscription for such an important interest.

Third, the railroads, either individually or collectively, may choose to assume some further share of the financial burden of the A. E. S. C. by becoming sustaining members, and for such subscriptions the A. E. S. C. should be able to give the railroads value received in direct and in indirect service.

From every angle it would seem as though the logical line of development for the railroads to pursue would be the pushing into this broader field of the fine standardization work in which they have pioneered and the taking of the important place that their position entitles them to. They may be assured of receiving from the other members a most cordial welcome.

A Side-Discharge Traction Drive Skip Hoist

ONE OF THE INTERESTING FEATURES of a skip hoist manufactured by the Maine Electric Company, Portland, Me., for use in elevating coal in power plants or coaling stations is a light automatic side discharge gate. These skip hoists are equipped with loading gates at the bottom which are opened by the descending bucket, allowing it to fill until the natural angle of repose of the material is obtained, when the flow of the material stops. The gate is then closed by the ascending bucket and held in the position by counterweights. Two buckets are used and are handled by a traction drive. When a bucket reaches the upper limit of its travel, a relatively light gate in its side is opened, discharging the material into a hopper from which it can be fed to any type of conveyor. These hoists are built to be operated by any of the customary types of automatic push button controls and are equipped with limit switches, overload relays, etc. With one type of control they can be set to operate continuously, the control being such that proper time is allowed at the travel limits for the filling and discharging of the material.



General Type of Construction of the Side Discharge Ship Hoist

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A PRIZE, consisting of a gold watch, is being offered by the Chicago & North Western for the best article on claim prevention written by any employee, and submitted before May 20.

General News Department

George P. Graham, Acting Minister of Railways and Canals of Canada, has been appointed Minister.

The Association of Railway Electrical Engineers will hold its annual convention in the Hotel La Salle, Chicago, from November 6 to 9, inclusive.

The International Association of Railroad Supervisors, successor to the International Association of Railroad Supervisors of Mechanics, has opened its membership to railroad supervisors of all departments. This action is expected by the officers of the organization to increase the membership from 30,000 to 170,000. The organization has stated its intention of drawing a definite line between the crafts and the supervisors.

Program for American Society for Testing Materials

The American Society for Testing Materials will hold its 26th annual meeting at the Chalfonte-Haddon Hall, Atlantic City, N. J., on June 25-29. Because of the increased volume of reports and papers to come before this meeting, 13 sessions have been arranged beginning on Monday evening and closing on Friday evening.

Power Brake Investigation Reopened

The Interstate Commerce Commission has ordered that its investigation of power brakes and appliances, on which weeks of hearings were held and on which the arguments were submitted some time ago, be reopened for the purpose of a test by the commission of the brake of the Automatic Straight Air Brake Company upon the Norfolk & Western.

Proposed Railroad Club for Chicago

A movement has been started for the establishment in Chicago of a railroad club similar to the Railroad Club of New York. It is being promoted by Arthur E. Hooven, recently business manager of the Railway Review, and formerly connected with the *Railway Age*.

Railway officials, railway supply manufacturers and other persons interested in railway matters would be eligible to membership. Under the plan an entire floor in one of the principal office buildings would be taken and private dining rooms and meeting rooms, as well as other club conveniences, would be provided.

It is proposed to limit the initial resident membership to 1,200, the non-resident membership to 600. Non-resident members would be persons whose business headquarters were more than 25 miles from Chicago.

The project for the organization of the club has been received with considerable favor by railway officers and railway supply manufacturers of Chicago.

I. C. C. Asks Further Data Regarding Use of Cars

The Interstate Commerce Commission has issued a supplemental order in connection with its investigation of the adequacy of locomotives and cars owned by common carriers used in the transportation of freight, calling upon the railroads to furnish by May 25 supplemental information called for in Appendices S and T to the questionnaire which was sent out some time ago. Appendix S calls for information, as to the various commodities, of the number of cars of revenue carload freight originated by reporting carrier on the 16th, 17th, 18th, 19th and 20th of January, April, July and October, the total miles such loads were hauled by originating carrier, and the total miles hauled by other carriers, and number of cars of revenue carload freight received from connections during such periods. This information is also to be classified in accordance with the types of cars used. Appendix T calls for information regarding refrigerator cars owned or leased on December 31, including date built or rebuilt, whether car is suitable for fruits and vegetables, material used for insulation, and details regarding bunker construction, bulkheads, floor racks, etc.

Canadian Cars in the U. S.

C. P. Riddell, secretary of the Railway Association of Canada, on April 27 gave the excess of Canadian cars held in the United States over American cars held in Canada as 30,852. This total was said to represent a considerable amelioration of conditions existing during the winter when the shortage of cars for Canadian industry—particularly the lumber producers of the Maritime provinces—was acute.

Group Life Insurance on the Central of Georgia

The Central of Georgia Railway has adopted an arrangement under which its skilled employees may avail themselves of group life insurance at low rates. The amount is to be based upon the employee's annual pay from a minimum of $1,000 to a maximum of $3,000. Provision is made for compensation in cases of permanent disability. The premium to be paid by the employee is 60 cents per month per thousand of insurance. The remainder of the premium is paid by the railway company.

This is in addition to the pension system, the benefits of which the company extends without cost to the employee. President William A. Winburn, in a circular announcing the scheme to employees says:

"These matters are apart from the underlying desire of the company to provide continuous employment at fair compensation. Thought is given at all times toward making conditions surrounding work for this company safe and comfortable. These are some of the things that make work for the Central of Georgia attractive. The task of providing dependable transportation for the public is one of dignity and importance. It offers interest, opportunity, and compensation to those engaged in it. I feel sure that all of you in the service take pride in your work. You need have no hesitation in letting the public know of your reasons for this pride in your calling and in your company."

"Food at Fifty Miles an Hour Costs"

The cost of operating dining cars on the express trains of the Pennsylvania Railroad has been made the subject of a little 20-page pamphlet, which has been issued by the company, with the above title. The text is a reprint of an article which was published in "The Nation's Business," purporting to be a narrative in the shape of an interview between Raymond Willoughby and an officer of the road, the reporter posing as a passenger in a dining car who is in a complaining state of mind because the prices are so high.

The substance of the information here given about the cost of dining car operation and maintenance was given in the *Railway Age* of March 3, last, page 502, but without naming the railroad. Since then, the management of the road has laid aside its excessive modesty, and the facts are now given with some interesting local details. Readers of the *Railway Age* will recall that in 12 months, on the lines east of Pittsburgh, the expenditures in the dining car department totaled about $3,200,000, with a loss of over half a million.

The pamphlet is embellished with halftone illustrations, including portraits of a steward, a cook and a waiter. In the territory east of Pittsburgh, the number of dining cars operated is 77, of which usually five are in the shops for repairs. Usually the dining car department has to run eight special cars a day to cover irregularities, such as special trains and extra sections of regular trains. Speaking of the fluctuating character of the business, the writer cites one instance of a car which entertained 35 customers on one day and 125 on the next. The crews are subjected to a physical

examination each month and their living quarters are scrutinized with equal care.

Referring to the pay of the waiters which, on the payroll, is $55 a month, the railroad officer says, "I do not know how to figure their tips, but they surely pick up considerable money from that source."

Great Northern Publicity Program

The Great Northern has undertaken an extensive program of publicity, the first of the "talks," appearing as an advertisement in 450 papers in the territory served by its lines. The purpose of this campaign is stated by Louis W. Hill, chairman of the board, as follows:

"There is an old saying that you cannot hate a man when you are well acquainted with him. Let us get better acquainted and cultivate good will. The entire business activity of the Great Northern's territory is so dependent upon good transportation at low rates that no farmer or business man can afford to be hostile to the Great Northern. Every blow aimed at the railroad, every act of the legislature imposing needless regulations or burdens of expense upon the railroad, damages other business and agriculture as surely as if aimed directly at them. What hurts them, hurts the railroad, and what hurts the railroad hurts them."

The second advertisement emphasized the fact that the shipper must pay the bill if laws increase railroad costs, while the third analyzed the results of the operation of the railroads of the country as a whole, with detailed figures of the Great Northern's operating revenues and expenses in 1922.

Roads File Reports on Excess Earnings

Most of the roads have filed with the Interstate Commerce Commission the reports called for by May 1 as to their net operating income in excess of 6 per cent, if any, for the year 1922, although some have asked an extension of time. The reports indicate very little excess and as the commission has not yet determined the value on which the 6 per cent is to be calculated, there is no uniformity in the basis on which the reports are made. The roads were allowed to make their own claims as to value for the purpose of these returns provided they explained the basis on which they calculated it and some have used book value, others cost of reproduction and others a readjusted book value. Some have explained that there are unsettled questions as to what is to be included in the value as property devoted to transportation purposes. A few roads have reported excess without sending remittances on the ground of the uncertainty of the whole question of recapture, and the great difficulty they might experience in ever getting the money back from the government if they paid too much. A large number of the roads have made their returns under protest, referring to the litigation as to the validity of the statute. The commission will check the returns both as to value and as to the amount of income reported, as various accounting questions are involved, including the question of lapovers, and it will be some time before the commission will be in a position to attempt to collect any definite sum of money.

Annual Meeting of Chamber of Commerce

The annual meeting of the Chamber of Commerce of the United States will be held in New York next week. The meeting will be largely devoted to transportation. Portions of the program of interest to railway men follow:

Tuesday, May 8

GENERAL SESSION—10:30 A. M.

Hippodrome Theater

Address of Welcome. Lewis E. Pierson, president, Merchants Association of New York.

Address. Hon. Raita Fujiyama, president, National Federation of Chambers of Commerce of Japan.

Annual Address. Julius H. Barnes, president, Chamber of Commerce of the United States.

GROUP LUNCHEON MEETINGS—1 P. M.

Domestic Distribution, Astor Gallery, Waldorf-Astoria Hotel

Pool Car Shipments as an Aid to Distribution. W. Lee Cotter, Cotter Warehouse, Mansfield, Ohio.

Store-Door Deliveries of Freight. W. J. L. Banham, traffic manager, Otis Elevator Company, New York, N. Y.

Transportation Obstructions to Distribution. Hon. Sydney Anderson, Member, House of Representatives from Minnesota.

Fabricated Production, Roof Garden, Waldorf-Astoria Hotel

The Effect of Freight Rates on Production and Manufacturing Costs. Robert S. Binkerd, publicist, New York.

The Voluntary Setting Up of Quality Standards in Commodity Production. Frederick W. Kelley, president, Helderberg Cement Company, Albany, N. Y.

Employee Education in Fundamental Economics—How to Tell the Story. Carl F. Dietz, president, Bridgeport Brass Company, Bridgeport, Conn.

Finance, Green Room, Waldorf-Astoria Hotel

Agricultural Credits.

Credit Requirements of the Railroads.

From the Standpoint of the Railroads.

From the Standpoint of the Investor. Pierpont B. Davis, vice-president, National City Company, New York.

GENERAL SESSION—8 P. M.

Hippodrome Theater

Address. Hon. Herbert Hoover, Secretary of Commerce.

European Conditions and American Business. Willis H. Booth, vice-president, Guaranty Trust Company, New York, N. Y.

Wednesday, May 9

GENERAL SESSION—10 A. M.

Metropolitan Opera House

President Barnes in the Chair.

General Topic: Developing a National System of Rail, Water and Highway Transportation.

The Coordination of Our System of Transportation. Hon. C. A. Newton, Member, House of Representatives from Missouri.

Cooperation Between Motor and Railroad. Roy D. Chapin, chairman of the board, Hudson Motor Car Company, Detroit, Mich.

Coordination of Railroads, Waterways and Highways. C. H. Markham, president, Illinois Central, Chicago, Ill.

GROUP LUNCHEON MEETINGS—1 P. M.

Insurance, Roof Garden, Waldorf-Astoria Hotel

Insurance Investments in Railroads. Asa S. Wing, president, Provident Mutual Life Insurance Company, Philadelphia.

Natural Resources Production, Green Room, Waldorf-Astoria Hotel

Some Problems of Coal Distribution. J. D. A. Morrow, president, Morrow-Callahan Coal Company, Pittsburgh, Pa.

Labor and Its Effect on the Cost of Industrial Coal. J. G. Bradley, president, Elk River Coal & Lumber Company, Dundon, W. Va.

Economic vs. Legislative Solution of the Coal Problem. George H. Cushing, Cushing's Survey & Service, Washington, D. C.

Transportation and Communication, Grand Ball Room, Waldorf-Astoria Hotel

General Topic: Progress Reports of Special Committee appointed by President of Chamber of Commerce of the United States.

Governmental Relations to Transportation. Chairman, George A. Post, president, George A. Post Company, Inc., New York.

Railroad Consolidations. Chairman, Carl R. Gray, president, Union Pacific.

Readjustment of Relative Freight Rate Schedules. Chairman, F. A. Delano, Washington, D. C.

Relation of Highways and Motor Transport to Other Transportation Agencies. Chairman, A. H. Swayne, vice-president, General Motors Corporation.

Development of Waterways and Coordination of Rail and Waterway Service. Chairman, W. L. Clause, chairman of the board, Pittsburgh Plate Glass Company.

Thursday, May 10

GENERAL SESSION—10 A. M.

Hippodrome Theater

The Farmer's Interest in Transportation. O. E. Bradfute, president, American Farm Bureau Federation.

Financial Support for the Railroads. W. N. Doak, senior vice-president, Brotherhood of Railroad Trainmen.

Re-establishment of Railroad Credit. Walter W. Head, president, Omaha Trust Company.

GENERAL SESSION—2:30 P. M.

Hippodrome Theater

Governmental Operation of the Railroads.

Report of Committee on Nominations and Election of Directors.

Consideration of Resolutions reported by Committee on Resolutions.

Shop Crafts Abandon Defense of Injunction

The Federated Shop Crafts have abandoned their defense against the attorney general's motion to make permanent the injunction against strike violence which was obtained against the shopmen last September. A hearing on the government's petition to make the writ permanent was to have started before Federal Judge Wilkerson in Chicago on May 2. In abandoning their defense, the shopmen claim that they have already won the principal points in the controversy, but a statement issued by Blackburn Esterline, assistant solicitor general of the United States, declares that the

(*Continued on page* 1128)

Operating Statistics of Large Steam Roads—Selected Items for the Month of February, 1923,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1923	394	294,611	312,549	29,058	4,925	73.2	251,819	108,632	112	27	19.6	...
	1922	394	243,687	262,649	29,460	4,409	67.1	230,565	92,999	116	27	18.9	...
Boston & Maine	1923	2,455	530,944	580,202	49,052	9,682	75.2	491,828	216,532	316	137	30.2	2
	1922	2,455	508,759	568,945	50,128	10,611	70.1	551,380	230,200	322	133	29.2	45
N. Y., New H. & Hartf	1923	1,974	387,581	417,754	35,593	8,445	75.0	431,662	200,063	282	100	26.1	...
	1922	1,977	401,272	440,744	24,735	9,892	69.5	502,667	217,154	280	78	21.7	22
Great Lakes Region:													
Delaware & Hudson	1923	886	309,349	439,389	34,778	6,920	66.4	452,747	234,922	234	65	21.8	8
	1922	887	366,260	483,721	32,691	8,819	62.5	595,560	302,633	272	42	13.5	97
Del., Lack. & Wn	1923	993	424,746	539,762	99,289	11,287	68.6	656,886	320,461	282	98	25.8	3
	1922	994	476,367	589,526	111,654	13,688	68.5	744,907	340,494	300	64	17.5	17
Erie (inc. Chic. & Erie)	1923	2,309	1,089,495	1,265,208	55,202	34,958	72.7	2,047,821	1,028,014	589	179	23.4	1
	1922	2,309	919,950	1,047,472	58,437	28,185	65.8	1,712,226	807,706	546	221	28.8	30
Lehigh Valley	1923	1,317	401,728	454,179	57,703	9,378	67.2	597,362	309,204	280	264	48.5	1
	1922	1,316	536,752	594,956	67,491	15,151	66.1	907,383	427,151	402	140	25.8	105
Michigan Central	1923	1,827	583,273	602,581	22,913	17,577	70.4	915,103	390,263	300	83	21.6	9
	1922	1,827	480,395	487,707	20,001	14,187	63.1	788,062	312,256	315	95	23.1	76
New York Central	1923	6,486	2,392,446	2,787,602	217,703	72,831	64.1	4,453,639	2,094,816	1,208	518	30.0	15
	1922	6,486	1,924,779	2,145,803	136,959	61,804	61.1	3,738,479	1,637,850	1,186	529	30.8	269
N. Y., Chic. & St. L	1923	1,225	478,330	493,182	3,311	12,749	69.4	701,228	315,379	160	69	30.2	5
	1922	1,225	456,082	460,646	1,516	12,941	65.7	704,401	297,425	183	68	27.1	48
Pere Marquette	1923	2,182	338,502	355,250	5,982	8,141	73.6	445,288	219,042	162	39	19.4	...
	1922	2,191	297,672	307,783	6,490	7,469	66.1	438,924	169,537	153	54	26.0	21
Pitts. & Lake Erie	1923	231	163,820	168,292	673	5,669	62.4	379,879	219,339	59	16	21.7	...
	1922	228	95,046	100,360	666	3,108	58.2	228,738	125,946	59	20	25.5	8
Wabash	1923	2,418	526,744	557,828	7,463	15,428	76.6	783,595	348,279	246	93	27.5	...
	1922	2,418	607,432	642,481	7,890	15,816	69.7	874,279	396,186	263	76	22.4	9
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio	1923	5,212	2,054,224	2,375,951	151,397	53,984	68.5	3,207,595	1,613,847	1,021	269	20.9	7
	1922	5,285	1,638,005	1,921,443	148,436	41,097	63.1	2,656,068	1,335,192	912	479	34.4	107
Central R. R. of N. J	1923	695	281,012	307,722	35,287	5,505	62.1	361,684	181,567	198	71	26.4	...
	1922	692	275,072	309,831	40,141	5,728	56.7	395,102	194,954	218	38	14.9	10
Chicago & Eastern Ill	1923	945	259,405	267,433	4,330	6,196	64.7	386,829	199,654	111	61	35.4	4
	1922	945	209,002	210,622	3,178	5,042	61.6	316,505	159,969	117	40	25.4	33
Cleve., Cin., Chic. & St. L	1923	2,377	686,853	721,841	6,454	19,932	66.0	1,238,296	611,659	313	128	29.1	...
	1922	2,387	662,316	698,447	6,150	17,920	57.1	1,183,332	547,725	319	128	28.6	16
Elgin, Joliet & Eas[1]	1923	460	137,219	153,079	9,386	3,895	67.2	296,664	164,874	84	16	15.8	...
	1922	459	102,214	115,629	7,652	2,949	63.9	227,959	122,139	96	12	11.2	28
Long Island	1923	383	43,401	55,901	7,864	510	58.2	30,724	11,842	42	11	20.5	...
	1922	394	38,081	41,021	6,654	426	60.6	24,250	9,342	38	9	19.7	2
Pennsylvania System	1923	10,884	4,341,023	4,814,989	387,681	108,613	67.6	7,015,498	3,566,251	2,535	794	23.9	...
	1922	10,882	4,120,605	4,512,155	345,450	101,980	61.7	7,040,286	3,504,507	2,548	884	25.8	494
Philadelphia & Reading	1923	1,147	719,992	820,295	94,713	17,157	66.3	1,142,311	619,992	335	81	19.4	3
	1922	1,119	554,431	621,532	76,186	13,284	61.2	924,779	488,780	349	77	18.2	125
Pocahontas Region:													
Chesapeake & Ohio	1923	2,553	759,314	838,442	20,360	21,944	60.5	1,640,289	904,722	407	101	19.9	4
	1922	2,548	766,212	861,572	19,658	21,914	57.1	1,727,208	938,567	453	107	19.2	56
Norfolk & Western	1923	2,228	757,610	977,092	39,108	18,940	62.4	1,439,050	783,585	522	175	25.1	41
	1922	2,228	739,523	898,226	33,700	20,583	57.3	1,610,593	872,349	600	105	14.9	206
Southern Region:													
Atlantic Coast Line	1923	4,860	798,296	804,957	15,000	18,605	64.5	982,502	395,068	319	76	19.2	...
	1922	4,924	642,368	651,331	10,095	14,261	58.6	762,727	265,862	289	103	26.2	26
Central of Georgia	1923	1,907	275,846	278,952	5,220	5,824	74.5	305,699	145,099	113	19	14.2	...
	1922	1,899	188,671	189,126	2,834	4,340	75.7	210,416	94,127	107	27	19.9	11
Ill. C. (inc. Y. & M. V.)	1923	6,190	1,989,363	2,002,977	43,610	50,148	66.1	3,095,853	1,464,009	765	103	11.9	2
	1922	6,137	1,578,166	1,585,438	33,432	41,028	62.4	2,605,125	1,200,824	757	81	9.7	27
Louisville & Nashville	1923	5,022	1,462,725	1,565,768	52,918	26,025	67.8	1,591,656	790,898	596	114	16.1	...
	1922	5,021	1,420,177	1,512,419	58,154	25,103	58.9	1,661,297	786,877	573	98	14.5	27
Seaboard Air Line	1923	3,550	532,524	542,767	5,980	11,269	66.4	613,078	244,373	197	67	25.2	...
	1922	3,537	395,152	404,981	7,829	8,554	65.2	455,208	171,957	173	72	29.4	...
Southern Ry.	1923	6,942	1,478,842	1,529,209	39,340	32,082	70.2	1,692,620	747,367	865	183	17.5	2
	1922	6,942	1,143,529	1,167,561	28,881	24,689	67.3	1,299,699	542,519	853	253	22.9	27
Northwestern Region:													
Chic. & N Wn.	1923	8,442	1,698,324	1,765,351	28,922	33,717	66.7	1,940,953	895,673	831	249	23.1	...
	1922	8,391	1,412,292	1,453,860	18,115	27,117	62.5	1,596,954	663,442	807	226	21.9	24
Chic., Milw. & St. P.	1923	11,022	1,757,867	1,816,431	74,861	40,269	65.7	2,331,088	1,102,750	860	199	18.8	19
	1922	11,027	1,446,957	1,496,665	63,944	32,263	65.9	1,838,002	862,789	839	206	19.7	82
Chic., St. P., M. & O.	1923	1,726	355,042	381,385	17,049	5,684	64.7	324,810	140,149	154	52	25.1	...
	1922	1,726	279,694	304,580	14,988	4,728	69.3	253,375	109,828	149	63	29.7	22
Great Northern	1923	8,255	907,391	941,849	45,640	20,637	66.0	1,220,776	578,385	531	223	29.6	8
	1922	8,265	686,792	709,801	27,373	15,735	70.8	885,415	422,112	581	177	23.4	181
M., St. P. & S. Ste. M.	1923	4,352	504,882	513,057	9,904	10,772	76.9	540,407	267,777	277	68	19.6	4
	1922	4,355	360,468	392,376	7,655	7,237	73.7	360,456	168,501	294	57	16.2	33
Northern Pacific	1923	6,422	879,449	924,403	54,224	23,257	74.7	1,288,444	638,073	548	172	23.8	18
	1922	6,414	681,178	712,735	45,809	17,194	74.6	935,625	456,948	541	152	21.9	90
Oreg.-Wash. R. R. & Nav.	1923	2,185	197,003	222,016	32,178	4,659	71.8	257,368	119,381	125	50	26.6	6
	1922	2,166	183,202	208,904	28,795	4,446	70.7	259,208	125,235	125	37	22.7	2
Central Western Region:													
Atch., Top. & S. Fe	1923	9,869	1,509,090	1,579,988	79,455	39,574	69.8	2,140,625	859,836	708	212	23.1	51
	1922	9,798	1,203,323	1,256,278	56,015	30,180	66.5	1,647,158	635,183	800	179	18.2	232
Chicago & Alton	1923	1,010	338,771	343,727	7,719	7,089	64.1	432,972	206,981	117	32	21.3	1
	1922	1,010	337,966	342,933	5,223	6,863	60.2	439,430	200,877	109	41	27.3	4
Chic., Burl. & Quincy	1923	9,326	1,745,191	1,819,968	80,608	43,776	63.5	2,684,614	1,283,229	801	196	19.7	4
	1922	9,326	1,432,790	1,497,557	67,855	36,488	63.0	2,221,848	1,061,044	696	259	27.1	88
Chic., Rock I. & Pacific	1923	7,635	1,235,404	1,257,546	15,391	25,416	69.4	1,360,007	592,093	533	175	24.7	6
	1922	7,662	1,161,251	1,180,184	9,124	24,406	67.7	1,344,500	596,666	589	171	22.5	61
Denver & R. G. Wn.	1923	2,593	238,975	299,663	56,076	4,648	68.2	280,528	138,195	235	99	29.7	2
	1922	2,593	194,969	241,145	48,452	4,163	66.9	251,096	122,786	241	67	21.8	43
Oreg. Short Line	1923	2,367	339,454	360,458	26,280	7,445	68.4	449,756	214,016	153	84	35.5	12
	1922	2,360	309,350	325,115	22,681	6,675	64.8	423,429	199,900	170	51	23.2	27
Southern Pacific	1923	6,923	1,011,654	1,156,094	195,995	29,488	67.2	1,650,198	673,228	584	207	26.1	23
	1922	6,925	803,856	922,974	163,866	22,523	70.3	1,245,918	537,475	532	205	27.8	38
Union Pacific	1923	3,709	890,268	909,397	55,708	25,020	73.1	1,298,609	548,455	375	181	32.6	58
	1922	3,665	808,295	820,816	34,922	22,172	72.2	1,209,706	548,162	412	126	23.4	93
Southwestern Region:													
Gulf, Colo. & S. Fe	1923	1,897	204,852	212,143	6,153	4,989	66.5	284,130	126,881	106	36	25.5	6
	1922	1,895	181,678	188,232	3,464	4,671	64.2	270,048	116,895	123	27	18.0	40
Missouri, Kansas & Texas	1923	1,658	241,643	242,255	7,589	6,578	66.8	360,546	152,492	93	92	49.7	5
	1922	1,658	176,537	176,674	3,512	4,638	58.2	271,639	104,820	143	42	22.6	77
Mo., Kans. & Tex. of Tex.	1923	1,739	190,570	194,840	3,329	3,572	64.5	204,188	83,830	76	64	45.5	6
	1922	1,738	167,690	171,933	1,910	3,421	60.6	201,113	80,920	87	48	35.5	19
Missouri Pacific	1923	7,112	899,248	906,296	28,601	21,102	73.5	1,157,497	546,139	370	227	38.0	...
	1922	7,264	974,860	984,823	28,043	23,255	68.3	1,316,624	608,315	436	152	25.9	5
St. Louis-San Francisco	1923	4,683	782,640	792,089	14,329	14,109	70.0	784,329	355,193	340	128	27.4	...
	1922	4,683	658,119	667,100	11,513	12,033	65.1	685,231	295,361	347	109	24.0	30
Southern Pacific Lines (in Texas and Louisiana)[2]	1923	3,710	533,741	536,151	5,477	11,792	66.7	676,480	296,940	184	108	37.1	3
	1922	3,710	487,179	489,586	3,270	9,835	64.3	583,951	257,364	195	97	33.2	13
Texas & Pacific	1923	1,953	229,260	229,260	3,107	5,642	67.4	308,164	122,456	102	100	49.4	1
	1922	1,953	227,661	267,763	1,792	5,221	64.3	290,293	112,786	123	85	40.8	22

[1]No passenger-train service. [2]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

Compared with February, 1922, for Roads with Annual Operating Revenues above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of Coal per 1,000 gross ton-miles including locomotive and tender	Passenger service: Train-miles	Passenger-train car-miles
New England Region:														
Boston & Albany	1923	1,354	8,553	9,907	2.6	....	855	369	22.1	392	24.2	9,849	254	278,192	1,731,523
	1922	3,735	4,768	8,503	6.1	1,177	946	382	21.1	391	27.6	8,431	222	274,553	1,724,009
Boston & Maine	1923	12,405	29,064	41,469	9.5	....	926	408	22.4	186	11.1	3,150	242	740,021	3,949,674
	1922	17,075	14,600	31,675	18.6	902	1,084	452	21.7	260	17.1	3,349	173	733,968	3,921,192
N. Y., New H. & Hart	1923	16,070	36,443	52,513	14.3	....	1,114	516	23.7	136	7.7	3,619	261	906,370	5,607,865
	1922	23,992	16,004	39,996	23.5	1,338	1,253	541	22.0	194	12.7	3,923	177	895,114	5,479,370
Great Lakes Region:														
Delaware & Hudson	1923	7,932	12,079	20,011	6.2	....	1,464	759	33.9	419	18.6	9,466	275	175,028	883,204
	1922	10,546	5,646	16,192	8.5	437	1,626	825	34.2	606	31.1	12,162	201	172,072	857,901
Del., Lack. & Wn	1923	12,090	13,730	25,820	3.9	30	1,547	754	28.4	443	22.7	11,525	273	438,390	3,036,460
	1922	16,003	6,151	22,154	13.6	....	1,564	715	24.9	549	32.2	12,233	214	442,148	3,059,466
Erie (inc. Chic. & Erie)	1923	22,453	38,899	61,352	8.5	....	1,880	944	29.4	598	28.0	15,898	176	532,427	3,698,155
	1922	40,358	17,585	57,943	19.9	7,852	1,861	878	28.7	498	26.4	12,491	162	607,063	4,216,303
Lehigh Valley	1923	19,428	18,489	37,917	5.5	213	1,487	770	33.0	291	13.1	8,386	258	312,116	2,350,268
	1922	30,900	9,443	40,343	12.7	4,023	1,691	796	28.2	378	20.3	11,589	186	312,941	2,283,663
Michigan Central	1923	8,215	24,002	32,217	7.6	....	1,569	669	22.2	433	27.7	7,631	159	528,548	4,527,652
	1922	17,876	13,555	31,431	18.2	1,607	1,640	650	22.0	355	25.5	6,105	143	495,130	4,371,320
New York Central	1923	58,143	101,579	159,722	9.3	....	1,862	876	28.8	468	25.4	11,535	163	2,339,654	17,318,891
	1922	92,956	49,703	142,659	20.9	10,014	1,942	851	26.5	410	25.3	9,019	137	2,218,598	16,589,536
N. Y., Chic. & St. L.	1923	3,217	13,918	17,135	8.3	....	1,466	659	24.7	657	38.3	9,191	168	136,817	689,507
	1922	6,386	8,386	15,219	14.4	309	1,544	652	23.0	698	46.2	8,668	132	124,485	576,916
Pere Marquette	1923	5,236	18,761	23,997	4.4	....	1,316	647	26.9	326	16.5	3,586	177	227,204	1,052,720
	1922	10,658	9,352	20,010	15.0	1,200	1,475	570	22.7	303	20.2	2,763	138	246,632	1,145,722
Pitts. & Lake Erie	1923	7,946	11,379	19,325	22.4	....	2,319	1,339	43.3	405	15.0	33,881	92	104,559	530,761
	1922	20,572	7,070	27,642	45.5	670	2,407	1,325	40.5	163	6.9	19,735	82	100,133	497,156
Wabash	1923	7,243	16,716	23,959	3.2	....	1,487	661	22.6	519	30.0	5,145	187	394,987	2,188,740
	1922	12,373	9,764	22,137	13.3	545	1,439	652	25.0	639	36.6	5,852	174	494,648	2,508,488
Ohio-Indiana-Allegheny Region:														
Baltimore & Ohio	1923	47,558	57,794	105,352	9.2	....	1,561	786	29.9	547	26.7	11,058	222	1,320,910	8,180,379
	1922	70,797	30,564	101,361	16.3	8,212	1,622	815	32.5	470	23.0	9,109	201	1,305,509	8,033,139
Central R. R. of N. J.	1923	11,835	16,565	28,400	7.2	....	1,287	646	33.0	228	11.1	9,336	243	309,113	1,388,273
	1922	20,572	7,861	28,433	5.5	7,995	1,436	709	34.0	245	12.7	10,067	185	301,023	1,411,194
Chicago & Eastern Ill.	1923	9,363	7,474	16,837	18.7	....	1,491	770	32.2	423	20.3	7,544	216	200,539	1,267,381
	1922	15,179	3,519	18,698	10.3	3,425	1,514	765	31.7	306	15.6	6,045	191	199,920	1,310,953
Cleve., Cin., Chic. & St. L.	1923	9,164	26,736	35,900	6.6	....	1,803	891	30.7	608	30.0	9,192	165	653,134	3,917,915
	1922	16,497	17,670	34,167	12.6	2,036	1,787	827	30.6	573	32.8	8,196	149	619,552	3,801,262
Elgin, Joliet & Ea.	1923	8,377	6,874	15,251	9.1	....	2,162	1,202	42.3	386	13.6	12,808	159	.....	.....
	1922	10,374	2,937	13,311	9.9	611	2,230	1,195	41.4	328	12.4	9,497	155	.....	.....
Long Island	1923	1,506	5,638	7,144	3.3	....	708	273	23.2	59	4.4	1,075	485	171,628	956,602
	1922	2,289	3,338	5,627	5.3	411	637	245	21.9	59	4.5	846	389	170,298	910,935
Pennsylvania System	1923	151,259	135,566	286,825	6.6	1,643	1,616	822	32.8	444	20.0	11,702	183	4,595,493	30,758,749
	1922	219,113	68,325	287,438	12.3	44,440	1,709	850	34.4	435	20.5	11,502	155	4,519,115	28,990,506
Philadelphia & Reading	1923	14,196	21,992	36,188	3.3	....	1,587	861	36.1	612	25.5	19,824	216	455,006	2,059,410
	1922	24,717	13,685	38,402	5.5	2,223	1,668	882	36.8	455	20.2	15,594	188	437,804	1,996,601
Pocahontas Region:														
Chesapeake & Ohio	1923	29,665	17,800	47,465	10.7	....	2,160	1,192	41.2	681	27.3	12,657	152	409,539	2,298,822
	1922	36,435	12,869	49,304	13.7	813	2,254	1,225	42.8	680	27.8	13,155	138	401,144	2,143,553
Norfolk & Western	1923	24,270	11,506	35,776	5.3	....	1,899	1,034	41.4	782	30.3	12,562	224	359,326	2,158,478
	1922	30,835	6,577	37,412	7.2	1,053	2,178	1,180	42.4	833	34.3	13,985	179	357,098	2,111,190
Southern Region:														
Atlantic Coast Line	1923	15,003	19,886	34,889	9.3	....	1,230	495	21.2	404	29.5	2,903	147	792,144	5,963,232
	1922	23,557	9,803	33,360	12.7	....	1,187	414	18.6	284	26.1	1,928	128	781,485	5,600,007
Central of Georgia	1923	2,095	6,541	8,636	6.5	....	1,108	526	24.9	600	32.3	2,718	195	319,776	1,768,803
	1922	4,592	2,789	7,381	16.7	....	1,115	499	21.7	455	27.7	1,770	158	291,728	1,540,581
Ill. C. (inc. Y. & M. V.)	1923	24,533	40,925	65,458	6.5	....	1,555	736	29.2	799	41.4	8,447	178	1,393,799	8,337,355
	1922	44,556	22,631	67,187	7.8	8,063	1,651	761	29.3	638	34.9	6,989	156	1,313,908	7,617,285
Louisville & Nashville	1923	24,581	27,637	52,218	11.1	42	1,088	541	30.4	541	26.3	5,625	218	934,698	5,499,065
	1922	37,553	13,991	51,544	12.7	78	1,170	554	31.3	545	29.5	5,597	178	932,056	5,292,980
Seaboard Air Line	1923	10,516	15,410	25,926	19.5	....	1,151	459	21.7	337	23.4	2,458	187	604,822	3,838,726
	1922	12,986	9,713	22,699	30.9	....	1,152	435	20.1	271	20.6	1,736	194	585,042	3,874,031
Southern Ry.	1923	27,168	33,586	60,754	8.7	....	1,145	505	23.3	440	26.9	3,845	222	1,211,894	7,078,242
	1922	41,202	17,674	58,876	15.7	3,022	1,137	474	22.0	329	22.2	2,791	211	1,179,491	6,645,649
Northwestern Region:														
Chic. & N. Wn.	1923	32,075	43,965	76,000	7.1	4,246	1,143	527	26.6	421	23.7	3,789	208	1,409,008	8,169,491
	1822	45,770	25,639	71,409	7.4	7,000	1,131	470	24.5	332	21.7	2,824	211	1,413,891	8,438,766
Chic., Milw. & St. P.	1923	35,960	42,117	78,077	7.6	....	1,326	627	27.4	504	28.0	3,573	199	1,309,740	7,727,469
	1922	49,582	25,861	75,443	15.8	....	1,270	596	26.7	408	23.2	2,794	203	1,318,091	7,769,171
Chic., St. P., M. & O.	1923	2,663	10,565	12,628	9.2	....	915	395	24.7	396	24.8	2,900	227	266,838	1,557,105
	1922	3,547	11,159	14,706	13.1	425	906	393	23.2	267	16.6	2,272	205	270,049	1,494,650
Great Northern	1923	37,712	14,418	52,130	7.3	....	1,345	637	28.0	396	21.4	2,502	222	849,011	4,895,486
	1922	46,190	5,554	51,744	12.5	....	1,289	615	26.8	291	15.3	1,824	218	883,202	5,004,901
M., St. P. & S. Ste. M.	1923	13,945	9,333	23,278	7.4	70	1,070	530	24.9	411	21.5	2,197	161	356,481	1,931,712
	1922	19,002	4,768	23,770	12.1	1,333	1,000	468	23.3	253	14.8	1,382	185	369,593	1,998,239
Northern Pacific	1923	26,442	10,090	36,532	11.0	....	1,465	726	27.4	624	30.4	3,548	164	726,052	4,522,540
	1922	36,777	6,784	43,561	10.1	1,673	1,374	671	26.6	375	18.9	2,545	168	751,806	4,634,138
Oreg.-Wash. R. R. & Nav.	1923	5,531	4,955	10,486	3.2	....	1,306	606	25.6	407	22.1	1,951	249	233,010	1,478,357
	1922	5,876	3,344	9,220	3.1	3,017	1,415	684	28.2	485	24.4	2,065	246	232,072	1,494,842
Central Western Region:														
Atch., Top. & S. Fe	1923	38,258	20,364	58,622	7.3	3,801	1,418	570	21.7	524	34.5	3,112	170	1,627,560	12,271,843
	1922	48,914	11,468	60,382	7.6	11,874	1,369	528	21.0	376	26.8	2,315	166	1,565,338	11,625,508
Chicago & Alton	1923	5,889	8,422	14,311	7.7	....	1,278	611	29.2	517	27.6	7,317	235	262,783	1,521,637
	1922	9,937	5,669	15,606	3.7	846	1,300	594	29.3	460	26.1	7,101	204	247,511	1,414,845
Chic., Burl. & Quincy	1923	36,026	34,324	70,350	7.5	....	1,538	735	29.3	651	35.0	4,914	205	1,345,850	8,490,221
	1922	45,485	18,667	64,152	9.5	160	1,551	741	29.1	591	32.2	4,063	188	1,310,640	8,053,456
Chic., Rock I. & Pacific	1923	22,804	21,424	44,228	10.1	630	1,101	479	23.3	478	29.6	2,770	217	1,166,708	6,512,097
	1922	33,450	13,306	46,756	10.5	6,560	1,158	514	24.4	456	27.5	2,781	194	1,173,677	6,516,935
Denver & R. G. Wn.	1923	10,716	4,108	14,824	9.1	930	1,174	578	29.7	333	16.4	1,903	280	204,963	1,264,740
	1922	12,778	3,447	16,225	12.8	1,834	1,288	630	29.5	270	13.7	1,691	234	205,356	1,261,763
Oreg. Short Line	1923	4,956	4,135	9,091	7.0	6	1,325	630	28.7	841	42.7	3,229	165	258,650	1,802,326
	1922	6,830	3,820	10,650	7.0	952	1,369	646	29.9	670	34.6	3,025	164	259,307	1,767,071
Southern Pacific	1923	17,757	21,486	39,243	5.3	1,422	1,631	665	22.8	613	40.0	3,473	160	1,197,892	9,691,412
	1922	23,394	16,808	40,202	7.0	6,051	1,550	669	23.9	477	28.3	2,772	167	1,184,099	9,065,742
Union Pacific	1923	12,510	8,472	20,982	7.0	1,976	1,458	616	21.9	934	58.2	5,282	182	773,338	6,034,217
	1922	17,758	6,814	24,602	14.7	3,142	1,497	678	24.7	796	44.6	5,341	171	777,665	6,007,824
Southwestern Region:														
Gulf, Col. & S. Fe	1923	6,562	4,495	11,058	4.6	1,335	1,387	619	25.4	410	24.2	2,389	161	175,637	985,439
	1922	8,850	3,376	12,226	4.1	1,917	1,486	643	25.0	342	21.3	2,204	148	174,810	960,225
M., Kans. & Texas	1923	8,439	8,103	16,542	8.1	....	1,492	631	23.2	329	21.3	3,284	177	241,767	1,726,845
	1922	9,027	5,029	14,056	5.4	5,532	1,539	594	22.6	266	20.3	2,257	158	241,466	1,748,103
Mo., Kan. & Tex. of Tex.	1923	405	9,407	9,812	12.2	....	1,071	440	23.5	305	20.2	1,722	199	227,625	1,421,262
	1922	307	11,150	11,457	7.4	3,975	1,199	483	23.7	252	17.6	1,663	166	242,625	1,432,633
Missouri Pacific	1923	21,272	35,315	56,587	8.0	....	1,287	607	25.9	345	18.1	2,743	201	894,474	5,077,073
	1922	52,920	18,168	51,088	9.2	2,770	1,351	624	26.2	425	23.8	2,991	174	855,824	4,964,200
St. Louis-San Francisco	1923	13,349	20,039	33,388	6.9	....	1,002	454	25.2	380	21.6	2,709	242	674,155	3,704,767
	1922	20,903	7,788	28,691	8.5	....	1,041	449	24.5	368	23.0	2,216	204	676,310	3,738,253
Southern Pacific Lines (in Texas & Louisiana)	1923	6,193	14,385	20,578	6.3	650	1,267	556	25.2	515	30.7	2,858	145	493,797	3,307,965
	1922	9,409	13,948	23,357	13.4	2,539	1,199	528	26.2	394	23.4	2,477	138	487,033	3,172,930
Texas & Pacific	1923	4,242	8,926	13,168	13.7	....	1,344	534	21.7	332	22.7	2,240	171	261,738	1,656,270
	1922	6,663	4,786	11,449	17.7	....	1,275	495	21.6	352	25.3	2,063	159	268,490	1,746,847

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

(*Continued from page* 1125)

action of the shopcraft amounts to a default resulting from the fact that "the defense has no defense."

Instructions to the government attorneys to present to the court the entire testimony taken by the government relating to the injunction were Attorney General Daugherty's answer to the withdrawal of the counsel for the labor unions in their efforts to permit the case to go by default. Blackburn Esterline, assistant solicitor general, was instructed to go on with the case in connection with the application for a permanent injunction. Mr. Daugherty issued a statement saying that the step taken by counsel for the defendants was in keeping with the recent impeachment proceedings against him and that he had refused a request made by them to dismiss the case. He took the position that the proceeding must be carried to a final conclusion "in order that universal strikes which interfere with the transportation system of the country shall be a thing of the past."

Wage Statistics for February

The number of employees reported by Class I roads for the month of February, 1923, was 1,783,555, an increase of 4,039, or 0.2 per cent, as compared with the returns for January, 1923, according to the Interstate Commerce Commission's monthly summary of wage statistics. The total compensation was $230,416,541, a decrease of $19,635,245, or 7.9 per cent. This decrease in compensation, notwithstanding the increase in employment, is explained by the fact that February had only 23 working days while January had 26. Compared with the previous month, the increase or decrease (D) in the number of employees, by groups, was as follows:

Executives, officials, and staff assistants	64
Professional, clerical, and general	D298
Maintenance of way and structures	D156
Maintenance of equipment and stores	2,589
Transportation (other than train, engine, and yard)	1,992
Transportation (yardmasters, switch tenders, and hostlers)	169
Transportation (train and engine service)	D321
Net increase	4,039

A comparison of the number of employees and their compensation, by months, follows:

Month	Number of employees	Total compensation
February, 1922[1]	1,545,040	$194,523,427
March, 1922[1]	1,570,158	216,704,408
April, 1922	1,578,133	203,413,071
May, 1922	1,628,228	216,672,028
June, 1922	1,685,414	222,932,689
July, 1922	1,467,824	193,571,244
August, 1922	1,594,074	224,976,644
September, 1922	1,708,591	238,735,394
October, 1922	1,804,315	255,514,000
November, 1922	1,820,463	249,286,713
December, 1922	1,788,590	247,672,515
January, 1923	1,779,516	250,051,786
February, 1923	1,783,555	230,416,541

[1]Excludes Detroit, Toledo & Ironton Railroad.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Louis B. Rhodes, Vapor Car Heating Company, Munsey Building, Washington, D. C. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago. Next convention, May 7-9, 1923, Norfolk, Va.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 So. Michigan Ave., Chicago. Next meeting, May 9, 1923, Signal Mt. Inn, Chattanooga, Tenn.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, September 17, 1923, Montreal, Que., Canada.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, June 13-15, 1923, Kansas City, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 8. W. 40th St., New York. Next convention, October 8-12, Atlantic City, N. J.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y.

Division I.—Operating, J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section (including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill. Annual meeting, June 19-21, St. Paul, Minn.

Medical and Surgical Section. J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York, N. Y.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Next annual meeting, March 11-13, 1924, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section. E. H. Fritch.

Electrical Section.—E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y.

Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual meeting, June 20-22, Orchestra Hall, Chicago. No exhibit in 1923.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Assocoiatien).—W. J. Farrell, 30 Vesey St., New York, N. Y. Annual meeting, May 15-17, 1923, Hotel Sherman, Chicago.

Division VII.—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill. Annual convention, May 29-31, Mount Royal Hotel, Montreal, Que.

Car Service Division.—C. A. Buch, 718 18th St., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 16-18, 1923, Seattle, Wash. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. Leckie, Industrial Agent, Kansas City Southern Ry., Kansas City, Mo. Annual meeting, May 9-11, St. Louis, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Next annual meeting, March 11-13, 1924, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C. Annual meeting, May 9, Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eisenman, 4600 Prospect Ave., Cleveland, Ohio.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, 1315 Spruce St., Philadelphia, Pa. Annual meeting, June 25, Chalfonte-Haddon Hall Hotels, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Prof. J. H. Dunlap, 33 W. 39th St., New York. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad session at Spring meeting, May 29, Montreal, Quebec.

Railroad Division—A. E. Stuebing, Managing Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—P. R. Hicks, Room 1146 Otis Bldg., Chicago. Next convention January 15-17, 1924, Muehlebach Hotel, Kansas City, Mo.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn. Next meeting, May 16-18, 1923, Brown Palace Hotel, Denver, Col.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual convention, October. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 320 Munsey Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—John Nelson, Joseph E. Nelson & Sons, 3240 South Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Assn.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Meetings, 2d Thursday, January to November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspecors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C. Annual meeting, May 10, 1923, Railroad Club, New York.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414 Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Next meeting, May 21-24, 1923, Hotel Winton, Cleveland, Ohio. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Annual convention, September 4-7, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Next convention, May 22-25, Hotel Tuller, Detroit, Mich.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A. Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—J. S. Penney, T. J. Moss Tie Company, St. Louis, Mo. Next convention, January 17-18, 1924, Muehlebach Hotel, Kansas City, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, Dec. 4, 1923, Miami, Fla.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wellner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Next meeting, June 13, 1923, Richmond, Va.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut St., Philadelphia, Pa.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Hotel, Fittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—J. W. Foggs, Bolts Nut Company, 1732 N. Kolmar Ave., Chicago. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A. Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V. (No exhibit in 1923.)

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Next convention, September 18-20, 1923, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205 Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual meeting, September, 1923, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 605 North Michigan Ave., Chicago. Regular meetings, 3d Monday each month, except June, July and August.

Traffic News

The annual meeting of the Traffic Clubs of America will be held at Indianapolis, Ind., on May 23 and 24.

"Uncanny" Freedom from Friction

"The industrial world is running on ball bearings," according to the Birmingham (Ala.) Age-Herald. Explaining this statement the Age-Herald says:

With excellent railroad service Birmingham products are moving to the world as they come from 100 per cent operation of mines, mills, furnaces and the plants where the finished articles are fashioned. The whole machine of production and consumption is running so smoothly as to be almost uncanny. No one is fretted, no one is nervous, none wears a worried look. The steel works continue at the unvarying maximum. Pressure pipes pile up in enormous volume. The United States Pipe booked 500 tons for Milwaukee and 200 for Hinsdale, Ill., following 1,000 tons for Miami, Fla., 5,000 for Fort Smith, Ark., 1,200 for Akron, O., 1,100 for Memphis, 700 for Duncan, N. C., etc. Spot standard foundry coke brings $9 and is sold as high as $10.

New Passenger Trains

Two new trains have been announced to give 19 hour service between Chicago and Washington. The Baltimore & Ohio will establish, on May 13, a new all-Pullman train to be known as the Capitol Limited which will leave Chicago at 1 p. m., arrive at Washington at 9:00 a. m., Baltimore at 10:00 a. m., Philadelphia at 12:22 p. m. and New York at 3:44 p. m. The Pennsylvania will establish a new train on May 6 to be known as the Washingtonian, which will leave Chicago at 1:00 p. m., arrive in Baltimore at 8:00 a. m. and Washington at 9:00 a. m. On April 29, the New York Central added a train which leaves Cleveland at 6:15 a. m., arrives at Buffalo at 10:40 a. m., and at New York at 9:15 p. m., and another which leaves Buffalo at 1:30 p. m. and arrives at Cleveland at 7:35 p. m. The Chicago, Milwaukee & St. Paul added a train on April 29, which leaves Chicago at 10:25 p. m. and arrives at Omaha at 3:15 p. m. The Wabash placed in service on May 1, new all-steel cars on its Banner Limited, which runs from Chicago to St. Louis. The Nashville, Chattanooga & St. Louis installed on May 1 the first solid mail and express train between the middle west and south, which will be run between Chicago and Atlanta via the Chicago & Eastern Illinois, the Louisville & Nashville and the Nashville, Chattanooga & St. Louis as a section of the Dixie Flyer.

Present High Cement Shipments Suggest Lower Summer Peak

The efforts of manufacturers in urging immediate acceptance of cement to avoid disappointment to shippers in the mid-season rush has met with response, according to car loadings for the first quarter, and should lighten the burden of the railroads during the summer. Figures collected by the U. S. Geological Survey and published by the Portland Cement Association show that the production of cement for the quarter totaled 25,669,000 bbl., and shipments 21,708,000 bbl. The shipments established a new record for that period and were 54 per cent above the average for the last five years. This heavy early movement of cement was accompanied by correspondingly large shipments of stone, sand and reinforcing steel.

Much of the first quarter's shipments was for dealers and for customers who will store it. The state highway departments are also co-operating with the railroads and the manufacturers by storing cement and aggregate to be used for highway construction this season. Illinois has required every contractor to put into storage before the season opens at least one-third of the cement needed for his contract. As a result over 1,000,000 bbl. of cement had been stored in Illinois before April 15 and aggregates were well stocked by April 1.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a supplemental report modifying its order in the standard time zone investigation so as to include southern Idaho within the third zone.

Oral arguments in the case in which the American Railway Express Company has asked for a general increase in rates will be held before the commission at Washington on June 28 and 29.

Oral arguments in the valuation case of the Chicago, Rock Island & Pacific will be held before Division 1 of the commission at Washington on May 16 on a motion made by the railroad relating to the introduction of testimony.

The Supreme Court of the District of Columbia has sustained a motion by the Interstate Commerce Commission to dismiss an appeal brought by the Pittsburgh & West Virginia and the West Side Belt, asking that the commission and the attorney general of the United States be enjoined from enforcing penalties provided in Section 20-a of the interstate commerce act and that the commission be enjoined from refusing to authorize the issuance of stock and the assumption of obligation with respect to certain securities as requested by the Pittsburgh & West Virginia in connection with the acquisition of the West Side Belt. The commission had held that if the application was granted, the result would be over-capitalization.

Court News

Parties to Shipping Contract May Limit Time Within Which to Sue for Breach

The North Carolina Supreme Court holds that the parties to a contract of shipment may fix a given time, shorter than that allowed by the general statute of limitations, within which suit for breach of the contract shall be brought, and in the absence of any unusual or extraordinary circumstances, such a stipulation, if reasonable, will be enforced.—Dixon v. Davis (N. Car.), 114 S. E. 8.

Supreme Court of the United States

Extra Compensation for Carrying Parcel Post Refused in Absence of Legislation or Contract

The Supreme Court of the United States holds that, under two four-year contracts to carry the mails over parts of its lines, made in 1910 and 1911, the St. Louis Southwestern is not entitled to additional compensation for carrying the parcel post (established January 1, 1913) for the period after June 30, 1913, beyond what was allowed by the Postmaster General, because "before that date Congress had made express provision for the additional compensation and in doing so had limited the amount payable. The power to grant or to withhold was, within the limit set, vested in the Postmaster General; and his decision as to additional compensation was conclusive except upon Congress."

The Act of March 4, 1913, c. 143, covering the period after July 1, 1913, made no provision authorizing additional pay to the railroads for carrying parcel post matter from January 1, 1913, to June 30, 1913. The court holds that as to this six months' period the railroad could not recover, in the absence of legislation giving a right to compensation, without showing a contract, express or implied, to pay the extra compensation. There being no such legislation or contract, the railroad could not recover, having made no protest against assuming the additional service, and there being no duress. "The Government did not in fact promise to pay for the extra service; nor did the legislation give to claimant a right to compensation." Judgment of Court of Claims affirmed.—St. Louis Southwestern v. United States. Decided April 23, 1923. Opinion by Justice Brandeis.

Foreign Railway News

Rumored in Mexico That A., T. & S. F. May Lease Mexican Central

Persistent rumors have been in circulation in Mexico for some time that the old Mexican Central system is about to be segregated from the National Railways of Mexico and pass into the hands of the Atchison, Topeka & Santa Fe. According to one report the Mexican government will continue to own a majority of the stock of the road and the Santa Fe will operate it under a lease arrangement. The Mexican Central is the largest and most important integral part of the National Railways. Its main line, which connects with the Santa Fe, the Southern Pacific, the Texas & Pacific, the El Paso & Southwestern and the Rock Island at El Paso, runs from that point to Mexico City. Some of its branch lines are equivalent to trunk lines in matter of volume of traffic. This is especially true of the division that runs from Aguas Calientes to Tampico and from Irapuato to Guadalajara. Its line from Guadalajara to the Pacific port of Manzanillo is also regarded as very important from the standpoint of possible future development of export and import traffic. Branch lines which also handle a considerable volume of freight in normal times run from Mexico City to Balsas and from Jiminez to Parral. The Santa Fé was one of the pioneer railroads to invade Mexico with its system. It constructed and owned for many years the railroad which runs from Benson, Ariz., to Guaymas, Mexico. It traded this line to the Southern Pacific for a stretch of road that runs out of Needles, Cal.

Rate Reductions in Britain

Effective May 1, the British railways reduced freight rates at an estimated cost to them of £9,000,000 per annum. Most freight rates in the country now stand at 75 per cent above pre-war and in general, reductions were made to bring most of the rates to from 50 to 60 per cent above pre-war. No reductions were made in passenger rates.

The reduction in freight rates has been expected and a few days prior to the granting of the reduction was urged by the Federation of British Industries in a letter which follows in part:

"Traffic receipts for the first quarter of 1923 show clearly that in the three groups serving the important industial areas of the Midlands and the North, these receipts are, with the reduced rates (granted last year), steadily rising above the figures for the corresponding dates in 1922, and that the upward movement in traffic commenced immediately after the general reduction of rates and charges on August 1 last, and has continued steadily ever since. This improvement in the volume of traffic is borne out by the official ton-mile figures as far as these are available and it seems a legitimate inference that the rate reductions made in 1922 have been largely responsible for it.

"In these circumstances the Federation feels that they are justified in asking the railway companies to adopt of their own accord and initiative a bold and generous policy in a matter which is of such importance to the general prosperity.

"They desire to point out that a voluntary reduction to the lowest possible level effected at an early moment would produce a feeling of confidence in the future stability of costs and prices which would be of the greatest assistance not only to the industrial and trading community generally by stimulating business and expanding employment, but to the railway companies themselves, by increasing the volume of traffic.

"In conclusion, the Federation desire to emphasize the importance of preserving that spirit of co-operation between the railway companies and railway users which has been one of the happiest results of the new relations created by the Railway Act, and to suggest that the railway companies have now an unparalleled opportunity to gain the confidence, co-operation and goodwill of industry and the public generally."

Negotiations between the railways and the shop crafts for a reduction of the war bonus have produced no results so far.

Equipment and Supplies

Locomotives

THE LOUISIANA & ARKANSAS is inquiring for 2 Mikado type locomotives.

THE BOYNE CITY, GAYLORD & ALPENA is inquiring for 2 Mikado type locomotives.

MINNEAPOLIS, NORTHFIELD & SOUTHERN is inquiring for 2 Mogul type locomotives.

THE PAULISTA RAILWAY, of Brazil, has ordered 2 Mountain type locomotives from the American Locomotive Company.

RICHMOND, FREDERICKSBURG & POTOMAC has ordered two 0-8-0 switching type locomotives from the American Locomotive Company.

THE FONDA, JOHNSTOWN & GLOVERSVILLE has ordered one 0-8-0 switching type locomotive from the American Locomotive Company.

THE MISSOURI PACIFIC, reported in the *Railway Age* of April 7 as inquiring for 35 locomotives, is now inquiring for 40 Mikado type and 10 Pacific type locomotives.

Freight Cars

THE CHICAGO & ALTON will place an order this week for repairs to 300 gondola cars.

J. WHITALL & CO., China, are inquiring through the car builders for 400 all steel gondola cars.

THE MINNESOTA STEEL COMPANY, Duluth, Minn., is inquiring for 20 flat cars also for 20 gondola cars.

THE CHESAPEAKE & OHIO has received bids on 1,000 box cars and expects to let contracts for this equipment about May 12.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY has ordered repairs to 200 refrigerator cars from the Koppel Car Repair Company, Koppel, Pa.

THE ATLANTIC COAST LINE, reported in the *Railway Age* of April 21 as inquiring for 50 ballast cars of 50 tons' capacity, has ordered this equipment from the Rodger Ballast Car Company.

THE ELGIN, JOLIET & EASTERN, reported in the *Railway Age* of April 21 as inquiring for 500 steel underframes has ordered 300 from the Ryan Car Company and 200 from J. W. Heggie & Sons incorporated.

Passenger Cars

THE ETTINGER PHILIPS COMPANY is reported to be inquiring for four passenger cars for South America.

THE NEW YORK CENTRAL has ordered four all-steel combination baggage and mail cars, 69 ft. 3 in. long, from the Standard Steel Car Company. These cars are for use on the Peoria & Eastern.

THE ATLANTIC COAST LINE, reported in the *Railway Age* of March 31 as inquiring for 25, 74-ft. steel coaches, 15, 70-ft. steel baggage cars, and 5, 70-ft. combination mail and baggage cars, has ordered this equipment and 2 mail cars from the Standard Steel Car Company.

Iron and Steel

THE NORFOLK & WESTERN is inquiring for 800 tons of bridge steel.

THE BALTIMORE & OHIO is inquiring for 1,000 tons of bridge steel.

THE PERE MARQUETTE is in the market for 14,000 tons of steel rails.

THE PENNSYLVANIA is in the market for 30,000 tons of steel rails.

THE ILLINOIS CENTRAL is inquiring for 421 tons of structural steel.

THE GREAT NORTHERN is inquiring for 220 tons of structural steel.

THE CENTRAL OF NEW JERSEY is inquiring for 22,000 tons of bridge steel.

THE CHICAGO, MILWAUKEE & ST. PAUL is in the market for 50,000 tons of steel rails.

THE CHICAGO & ALTON is inquiring for 1,500 tons of structural steel for a viaduct at Auxvasse, Mo.

THE NORTHERN PACIFIC has ordered 100 tons of structural steel from the Milwaukee Bridge Company.

THE DENVER & RIO GRANDE WESTERN is inquiring for 1,000 tons of structural steel for its shops at Denver, Colo.

THE MISSOURI PACIFIC has ordered 242 tons of structural steel for a bridge at Osage, Mo., from the American Bridge Company.

THE BOSTON & MAINE has let a contract for 500 tons of bridge steel to the Boston Bridge Works, and has also received bids on 500 tons additional.

THE WESTERN PACIFIC has ordered 345 tons of structural steel for a viaduct at Keddie, Cal., from the United States Steel Products Company.

THE UNION PACIFIC has ordered 2,382 tons of structural steel from the American Bridge Company and 1,284 tons from the McClintic-Marshall Company.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of February 3, as having ordered 18,000 tons of steel rail from the Illinois Steel Company, has divided an order for 40,000 tons between the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company.

Machinery and Tools

THE CHICAGO GREAT WESTERN has placed an order for a car wheel borer.

THE NEW YORK, ONTARIO & WESTERN has placed an order for a car wheel borer.

THE NEW YORK CENTRAL has placed an order for a journal turning axle lathe.

THE ST. LOUIS-SAN FRANCISCO has placed an order for a 600-ton wheel press.

THE CHICAGO & NORTH WESTERN is inquiring for 58 machine tools of various kinds.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for 74 machine tools of various kinds.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for jib cranes, trolleys and hoists for its Denver, Colo., shops.

THE WABASH has placed orders for a journal turning axle lathe, a car wheel borer, and a locomotive journal turning lathe.

THE SOUTHERN RAILWAY has placed orders for a 90-in. driving wheel lathe, a 600-ton wheel press, a 600-pound hammer, and a 100-ton bushing press.

Miscellaneous

THE CHILEAN STATE RAILWAYS have ordered 40 tons of copper sheets for locomotive boiler repairs from the American Brass Company. Orders for 106 tons of steel for springs, 180 tons of structural steel for car repairs, 150 tons of black iron sheets, and 80 tons of galvanized barbed wire for fencing have been placed with the United States Steel Products Company.

Supply Trade News

The Link Belt Company, Chicago, will construct a one-story machine shop 125 by 135 ft. to cost approximately $85,000.

The firm of **C. P. Sandberg,** consulting and inspecting engineers, has removed its New York City office from 143 Liberty street to 100 Broadway.

The Southern Signal Company, Lagrange, Ky., is planning the construction of a new factory for the manufacture of railroad signals and other devices.

The Gifford-Wood Co., Hudson, N. Y., has removed its Buffalo, N. Y., office to Peoples Bank building, corner Fourth avenue & Wood street, Pittsburgh, Pa.

P. W. Lawther, sales representative of **S. F. Bowser & Company, Inc.,** with headquarters at Dallas, Tex., has been promoted to sales manager of the Texas territory, with the same headquarters.

The Daniel Woodhead Company, Chicago, representatives for fans, lighting units for electrical departments and Keller pneumatic tools and reflectors, has moved its offices to 15 North Jefferson street.

W. B. Fraser, one of the partners in the **Coale-Fraser Lumber Company,** Lytton Building, Chicago, has assumed charge of the company's West Coast office, Tacoma, Washington, effective May 1.

W. C. Thatcher, assistant superintendent of construction of the **National Boiler Washing Company,** with headquarters at Chicago, has been promoted to general superintendent of construction, succeeding J. M. Weir, resigned.

Universal Portland Cement will be sold and invoiced by the sack instead of by the barrel beginning June 1. The price per sack on cement sold prior to that date will be determined by dividing by four the price per barrel. The change is a result of an inquiry sent to cement buyers.

The Truscon Steel Company has moved its Detroit, Michigan, office to temporary quarters in the Krolik building, 316 E. Jefferson street. Permanent quarters will be located in the new Truscon building now under construction at the northwest corner of W. Congress and Wayne streets.

The Standard Tank Car Company, Inc., Sharon, Pa., has removed its New York City office from 233 Broadway to suite 1222 in the Canadian Pacific building 342 Madison avenue. This company reports that it completed 750 new cars during the month of April, the largest output in this company's history.

Robert H. Gwaltney, manager eastern sales of the **T. H. Symington Company,** New York City, has been appointed vice-president in charge of eastern sales, with headquarters at New York City. Mr. Gwaltney will also have supervision of the Southern territory formerly handled in Baltimore by T. C. deRosset, deceased.

The Independent Equipment Corporation, McCormick building, Chicago, has been incorporated to lease and repair railway cars. **M. P. Krafftmiller,** formerly vice-president and treasurer of the General American Tank Car Corporation, is president; **G. A. Schoemaker,** formerly general manager of the Allegheny Steel Company, is vice-president; **A. E. Higgins,** formerly of the National City Bank, Chicago, is treasurer, and **J. E. Bittus** is secretary. The corporation will have a plant at Chicago and is now operating one at Warren, Pa.

Ross F. Hayes has resigned as general sales manager of the Curtain Supply Company to engage in the railway supply business with office at 2 Rector street, New York City. He is now eastern representative of the Henry Giessel Company, Chicago, manufacturers of water coolers for service on railway passenger cars and locomotives, also representative of the Protecto Manufacturing Company, Chicago, manufacturers of metal bound weatherstripping for railway cars. Mr. Hayes is also representing several other manufacturers of steam and electric railway equipment.

Graeme Ross has been appointed manager of the Kansas City branch office of the **Westinghouse Electric & Manufacturing Company,** East Pittsburgh, Pa., to succeed F. F. Rossman, who has resigned to become vice-president of the Mobile Light & Railway Company, Mobile, Ala.; **E. L. Doty,** district service manager of the Buffalo branch office, of the Westinghouse Electric & Manufacturing Company, has been appointed engineering assistant, service department, with headquarters at East Pittsburgh; **J. A. Atkinson** has been appointed Buffalo service manager; **C. W. Jones** has been appointed general foreman of the controller department at the East Pittsburgh works; **C. A. Fike** has been appointed general foreman of the coils and insulation department at East Pittsburgh works; **J. H. Hartman** has been appointed general foreman of the storekeeping department at the East Pittsburgh works and **W. S. Oswald** has been appointed general foreman of the railway motor department at the East Pittsburgh works.

The Buda Company

The annual report of the Buda Company for 1922, shows a net profit of $179,119, which is equal to $6.42 a share, on the $2,133,333 of common stock outstanding at the close of 1922. Current assets as of December 31, were $3,132,412 and current liabilities of $1,228,856. The balance sheet as of December 31, 1922, is as follows:

ASSETS

	1922	1921
Current assets and inventories:		
Cash on hand and in banks	$260,653	$319,966
U. S. Government Liberty Loan Bonds, par value $75,000	72,792	234,860
U. S. Government Four Year Treasury Notes, par value	165,000	.....
Accounts receivable	703,570	347,490
Notes and trade acceptances receivable	31,756	84,134
Inventories	1,898,640	1,968,017
Employees' subscriptions to common stock	86,200	.....
Fixed assets:		
Real estate	51,032	51,032
Buildings, machinery and equipment	1,494,176	1,582,338
Uncompleted additions and betterments	6,365	.....
Sinking fund for retirement of preferred stock*	124,100	104,704
Deferred charges:		
Prepaid interest and insurance	23,971	17,559
Prepaid taxes	2,410	2,648
Discount on preferred stock	74,405	77,178
	$4,995,070	$4,789,926

LIABILITIES

Notes payable	$1,007,500	$1,177,500
Accounts payable	221,356	63,843
Reserves	57,951	40,362
Capital stock (authorized $3,500,000):		
Common	2,133,333	1,507,000
Preferred—7 per cent cumulative	711,000	710,800
Surplus	1,290,421	1,290,421
Less: 33⅓ per cent common stock dividend	533,333	.....
Add: Net profit for year ending December 30, 1922	179,119	.....
Deduct: Dividends paid during 1922	72,277	.....
	$4,995,070	$4,789,926

*Under the sinking fund requirements covering retirement of preferred stock the company was obligated prior to March 1, 1923, to expend $18,393.34 more cash than is provided for above.

The company has no contingent liabilities on account of trade acceptance discounted.

A LETTER has been sent to the members of all legislatures in states where the lawmakers are now in session by the Thoroughbred Horse Association of America, calling attention to destruction of roads by trucks and urging a limitation of the load and speed, the establishing of an adequate license fee, and the placing of motor trucks under state railroad commissions in order to make them feeders and not competitors of railways. To impress the destruction of roads by motor trucks, the results of the test on the Bates experimental road in Illinois are cited. The results of the test, made by loaded three-ton motor trucks on 63 sections of road, each approximately 200 ft. long, representing all types of modern pavement, built especially for testing purposes, showed that in five months and two days all but nine of the 63 sections failed under the test.

Railway Construction

ANN ARBOR.—This company will construct a new roundhouse and machine shop at Owosso, Mich.

BALTIMORE & OHIO.—This company has awarded a contract to the Seaboard Construction Company, Philadelphia, Pa., for the erection of new superstructures at five bridges on the Ohio river district, Wheeling division, between Brooklyn Junction and Benwood. The new structures consist of deck plate girder spans ranging in length from 80 to 100 ft. The reconstruction of these bridges is part of the program undertaken for the purpose of extending the territorial operating limits of heavy power.

BALTIMORE & OHIO.—This company has awarded a contract to the Pittsburgh Construction Company, Pittsburgh, covering the erection of superstructures for a bridge crossing Boundary avenue, Pittsburgh, Pa., and a bridge crossing Stoney Creek, Hooversville, Pa. The steelwork involved includes plate girder spans ranging in length up to 106 ft., and also includes the dismantling of a detour trestle adjacent to the Pittsburgh structure.

BALTIMRE & OHIO.—This company is calling for bids for the construction of a brick freight house with concrete platforms at Pittsburgh, Pa., to cost $80,000.

CANADIAN PACIFIC.—This company has awarded a contract to E. B. Kimball for the construction of a branch line from Wymark, Sask., to Archive, reported in the *Railway Age* of March 31.

CHICAGO & NORTH WESTERN.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of two, 600-ton, reinforced concrete coaling stations at the Chicago shops, Chicago, Ill. This company has awarded a contract to Roberts Brothers, Chicago, for grading for a third main track between Elmhurst, Ill., and West Chicago, a distance of approximately 15 miles. This company has awarded a contract to the Bates & Rogers Construction Company, Chicago, for the construction of bridges on the same project.

CHICAGO & NORTH WESTERN.—This company contemplates the construction of an extension from Camp Crook, S. Dak., to Miles City, Mont.

CHICAGO & NORTH WESTERN.—This company is calling for bids for water treating plants which will be erected at six points in Iowa, including Sacton, Mondamin, Peterson, Laurens and Onawa

CHICAGO, BURLINGTON & QUINCY.—This company is calling for bids for the construction of a roundhouse at Beardstown, Ill.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is calling for bids for the construction of a passenger station at Moline, Ill. The company is also calling for bids for rebuilding of the roundhouse at Shawnee, Okla.

ILLINOIS CENTRAL.—This company has awarded a contract to the Frazier Company, Lincoln, Ind., for the construction of seven miles of second track from Springfield, Ill., to Barclay and of a new double-track bridge across the Sangamon river near Spaulding, Ill., to cost $410,000.

ILLINOIS CENTRAL.—This company has authorized the extension of 10 passing tracks on the Springfield division. Each extension is to be approximately 4,000 ft. long. The company has also authorized the construction of a second track between Clinton, Ill., and Salt Creek Spur.

NORTHERN PACIFIC.—This company has awarded a contract to Winston Brothers, Minneapolis, Minn., for the construction of a 35-mile branch line in Montana, as reported in the *Railway Age* of February 17.

OREGON SHORT LINE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Ammon to Dumas, Ida., 10.8 miles.

OSAGE RAILWAY.—The Interstate Commerce Commission has issued a certificate authorizing the construction of an extension of approximately 6 miles from Foraker to Shidley, Okla., to the line previously authorized from Foraker to the Osage oil fields, 11 miles.

PERE MARQUETTE.—This company, jointly with the Pennsylvania, has awarded a contract to the Roberts & Schaefer Company, Chicago, for the construction of a 500-ton reinforced concrete, four-track, automatic electric coaling station at the new engine terminal at Twenty-first street, Detroit, Mich., reported in the *Railway Age* of February 17, which will be used by both roads.

PHILADELPHIA & READING.—This company has awarded a contract to the Curtis-Grindrod Company, Philadelphia, for the rebuilding of its coal yard at Markley and Washington streets, Norristown, Pa.

SAN ANTONIO & MEXICAN.—This company, which has been incorporated in San Antonio, Tex., plans the construction of a line 170 miles long, from Three Rivers, Tex., via Mirando, to a point on the Rio Grande river, either Roma or Rio Grande City. A branch line to Laredo is also planned. Connections with the San Antonio, Uvalde & Gulf will be made at Three Rivers and Fowlerton, with the Texas-Mexican at Mirando and with the International-Great Northern and the National Railways of Mexico at Laredo. It is understood that the new line will become a part of the San Antonio, Uvalde & Gulf when completed. A. R. Ponder, of San Antonio, Tex., receiver and general manager of the San Antonio, Uvalde & Gulf, is one of the incorporators of the new line.

SOUTHERN.—This company contemplates the construction of a second track from Atlanta, Ga., to Birmingham, Ala.

ST. LOUIS-SAN FRANCISCO.—This company is calling for bids for the construction of a power house at Enid, Okla. The company is also calling for bids for the construction of the shop buildings at East Thomas, Ala., reported in the *Railway Age* of March 10.

ST. LOUIS-SAN FRANCISCO.—This company has awarded a contract to the Grant Smith Company, St. Louis, Mo., for the construction of second track from Valley Park, Mo., to Eureka, reported in the *Railway Age* of January 27. This company has also awarded contracts to E. T. White, Kansas City, Mo., and John R. Scott, St. Louis, Mo., for the reduction of grade at Dixon, Mo., to cost $100,000.

TEMISKAMING & NORTHERN ONTARIO.—This company will in August call for tenders for the completion of its extension north of Cochrane, Ont., from Tin Can Portage to Moose Factory on James Bay. The company also plans a new station at Haileybury to cost $30,000 and additions to offices at North Bay to cost from $60,000 to $75,000.

UNION PACIFIC.—This company will construct 53 miles of second track between Granger, Wyo., and Ogden, Utah, and another section of second track near Glensferry, Idaho.

UNION PACIFIC.—This company is calling for bids for the construction of a brick passenger station at Hayes, Kan., to cost $60,000.

WESTERN PACIFIC.—This company has awarded a contract to W. A. Bethel, San Leandro, Cal., for the construction of an 8-mile branch line near Gerlach, Cal.

Virginian to Electrify 134 Miles of Line

The Virginian Railway has decided to electrify 134 miles of line, including 213 miles of track, lying between Roanoke, Va., and Mullens, West Va. The section to be electrified crosses the Allegheny mountains. The undertaking will involve the expenditure of $15,000,000. The order for electric locomotives, power house equipment, transformer stations, and other apparatus has been awarded to the Westinghouse Electric & Manufacturing Company and constitutes the largest railroad electrification contract ever placed. The alternating-current, single-phase system with 11,000 volts on the trolley will be used. The maximum grade on the line is the 2.07 per cent grade west of the summit of Clark's gap. After electric operation is in use, 9,000-ton trains will be taken over this division at the rate of 14 miles an hour.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—*Annual Report.*—This company's annual report for 1922 is reviewed in an article on another page of this issue entitled "Santa Fe Earns Common Dividends Twice Over." See also excerpts from annual report on adjacent pages.

CHICAGO, MILWAUKEE & ST. PAUL.—*Equipment Trusts Sold.*—An issue of $13,500,000 5½ per cent certificates offered by the National City Company and Kuhn, Loeb & Co. at prices to yield 5.65 to 5.84 per cent, has been oversubscribed.

Authorized to Issue Bonds.—The Interstate Commerce Commission has authorized the Chicago, Milwaukee & St. Paul to issue $10,000,000 of 5 per cent general mortgage bonds to be sold not later than October 31, 1923, at a price to net not less than 90. All or any part may be pledged and repledged from time to time as collateral security for short term notes.

CHICAGO, ROCK ISLAND & PACIFIC.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to guarantee an issue of $8,550,000 of 5 per cent equipment trust certificates to be sold to Freeman & Co., New York, at 96.18.

Asks Authority to Abandon Line.—Application has been made to the Interstate Commerce Commission for authority to abandon its line from Guthrie to Chandler, Okla., 34.2 miles.

ERIE.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $900,000 of equipment trust certificates to be sold at not less than 96.94.

ILLINOIS CENTRAL.—*Equipment Trusts Sold.*—Kuhn, Loeb & Co. have sold at prices to yield 5.20 per cent $14,003,000 of 5 per cent equipment trust certificates, series "J," subject to the approval of the Interstate Commerce Commission.

MAINE CENTRAL.—*Equipment Trust Certificates Authorized.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $1,200,000 of equipment trust certificates to be sold at 99.25.

NEW YORK CENTRAL.—*Stockholders Urged to Oppose Restrictive Legislation.*—Calling attention to the recent remarkable service rendered by the railroads, President A. H. Smith has addressed a letter to the 35,000 company stockholders urging them to exert their influence against imposition of "any further hampering restrictions" upon the railroads by new legislation and specifically against tampering with the Transportation Act at this time.

President Smith confidently asserts the railroads will make good "if given a fair chance." His letter to stockholders, dated May 1, says:

> The recovery and performance of the railroads during the recent months under the Transportation Act are events unparalleled in American industry. If given a fair chance the carriers will continue to afford the nation the best service and the cheapest rates of any railroads in the world.
>
> The management of your company would invite your active assistance in combating the current unwarranted attacks upon the railroads by radicals and extremists which are designed to reach their climax by the opening of the next Congress.
>
> Public sentiment which develops and crystallizes between now and December will determine the measure of success of these attacks upon fundamental American principles and institutions. We would ask you, therefore, actively to exert your influence in the interim against destructive legislation.
>
> Specifically, we would ask you to communicate with your Congressman and Senator in opposition to any amendment of the Transportation Act or the imposition of further hampering restrictions upon the railroads.
>
> The Transportation Act has not yet had a fair trial under normal conditions, and while defects may exist and be demonstrated, its benefits in protecting essential transportation service are sufficient to make it imprudent to tamper with it now and thus open the way for radical revisions or substitutes which might work untold harm.

NORFOLK SOUTHERN.—*Annual Report.*—The annual report for the year ended December 31, 1922, issued last week, shows a net result of $659,944 as compared with a deficit of $9,720 in 1921. A selection of the principal items in the income account follows:

	1922	1921
Freight revenue	$6,469,657	$5,946,352
Passenger revenue	1,476,853	1,632,955
Total operating revenues	8,412,957	8,056,795
Maintenance of way and structures	1,182,652	1,228,318
Maintenance of equipment	1,296,602	1,213,132
Traffic	262,024	265,325
Transportation	3,498,665	3,653,783
General	349,349	386,599
Total operating expenses	6,595,435	6,752,509
Net railway operating income	1,817,522	1,304,286
Railway tax accruals	402,837	366,055
Total operating income	1,364,077	913,377
Gross income	1,500,608	1,020,259
Total deductions from gross income	1,391,557	1,343,933
Net income	109,051	Def. 323,674
Net credit for the year from redemption of bonds, sale of securities owned, settlement with U. S. Railroad Administration, etc	550,893	313,953
Net result for the year	659,944	Def. 9,720

TEXAS & PACIFIC.—*Annual Report.*—The annual report for the year ended December 31, 1922, issued last week, shows net income of $1,772,584 as compared with $2,740,724 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight revenue	$21,738,482	$24,346,031	—$2,607,549
Passenger revenue	7,279,004	8,686,959	—1,407,955
Total operating revenues	31,381,795	35,600,474	—4,218,679
Maintenance of way and structures	5,051,050	5,748,559	—697,509
Maintenance of equipment	6,544,264	6,712,086	—167,822
Traffic	586,305	611,309	—25,004
Transportation	11,843,491	13,777,591	—1,934,100
General	1,225,780	1,269,503	—43,724
Total operating expenses	25,494,086	28,424,905	—2,930,819
Net revenue from railway operations	5,887,710	7,175,570	—1,287,860
Railway tax accruals	1,230,397	1,437,974	—207,577
Operating income	5,269,960	6,377,819	—1,107,859
Net railway operating income	3,629,473	4,545,689	—916,216
Gross income	3,945,603	4,887,011	—941,408
Total deductions from gross income	2,173,018	2,146,287	26,732
Net income	1,772,584	2,740,724	—968,139
Total appropriation of income	1,772,584	2,422,097	—649,513
Income balance	.....	318,627	—318,627

TOLEDO, ST. LOUIS & WESTERN.—*Annual Report.*—The annual report for the year ended December 31, 1922, shows a net income of $1,146,783 as compared with $1,143,991 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Freight revenue	$10,681,350	$8,737,449	$1,943,901
Passenger revenue	360,448	365,358	—4,910
Total operating revenues	11,542,343	9,503,970	2,038,373
Maintenance of way and structures	1,297,063	1,531,323	—234,260
Maintenance of equipment	1,684,451	1,966,428	—281,977
Traffic	255,537	243,932	11,605
Transportation	3,593,406	3,383,736	209,670
General	1,815,450	194,390	1,621,060
Total operating expenses	8,645,606	7,319,062	1,326,544
Net revenue from railway operations	2,896,737	2,184,908	711,829
Railway tax accruals	604,841	438,369	166,472
Railway operating income	2,290,691	1,746,432	544,260
Gross income	2,638,405	2,237,079	401,326
Total deductions from gross income	1,491,622	1,093,088	398,534
Net income	1,146,783	1,143,991	2,792
Income applied to other reserve funds	.....	700	—700
Income balance transferred to credit of profit and loss	1,146,783	1,143,290	3,492

VIRGINIAN.—*Equipment Trusts Offered.*—A new issue of $5,700,000 one to fifteen-year 5 per cent equipment trust certificates is offered by a syndicate including the National City Company, Lee, Higginson & Co., and Kissel, Kinnicutt & Co., at a price to yield 5½ per cent. The fund so obtained, plus a cash payment of $1,900,000, will be used in the purchase of new equipment.

Dividends Declared

Central of New Jersey.—$2.00, quarterly, payable May 15 to holders of record May 9.

Delaware & Hudson.—2¼ per cent, quarterly, payable June 20 to holders of record May 28.

Illinois Central.—Common, 1¾ per cent, quarterly, payable June 1 to holders of record May 4.

Norfolk & Western.—Common, $1.75, quarterly, payable June 19 to holders of record May 31.

Pennsylvania Railroad.—1½ per cent, quarterly, payable May 31 to holders of record May 1.

Pullman Company.—$2.00, quarterly, payable May 15 to holders of record April 30.

Trend of Railway Stock and Bond Prices

	May 1	Last Week	Last Year
Average price of 20 representative railway stocks	64.06	65.98	65.26
Average price of 20 representative railway bonds	82.44	82.88	86.58

Annual Report

The Atchison, Topeka & Santa Fe Railway Co. — Twenty-Eighth Annual Report.

APRIL 3, 1923.

To the Stockholders:

Your Directors submit the following report for the fiscal year January 1, 1922, to December 31, 1922, inclusive.

The lines comprising the Atchison System, the operations of which are embraced in this report, and the mileage in operation at the end of the year as compared with the previous year, are as follows:

	December 31, 1922. Miles	December 31, 1921. Miles
Atchison, Topeka & Santa Fe Railway	8,864.02	8,862.47
Gulf, Colorado & Santa Fe Railway	1,908.89	1,907.64
Panhandle & Santa Fe Raliway	852.48	852.38
Grand Canyon Railway	64.09	64.09
Rio Grande, El Paso & Santa Fe Railroad	20.22	20.22
	11,709.70	11,706.80

Increase during the year 2.90 miles.

The average mileage operated during the fiscal year ending December 31, 1922, was 11,700.88, being an increase of 23.06 miles as compared with the average mileage operated during the preceding fiscal year.

The Company is also interested, jointly with other companies through ownership of stocks and bonds, in other lines aggregating 567.01 miles, namely Northwestern Pacific Railroad 516.91 miles and Sunset Railway 50.10 miles.

INCOME STATEMENT.

The following is a summary of the transactions of the System for the years ending December 31, 1921 and 1922:

	1921	1922
Operating Revenues	$228,925,069.91	$225,124,544.37
Operating Expenses	173,217,915.43	166,904,377.95
Net Operating Revenue	$55,707,154.48	$58,220,166.42
Railway Tax Accruals	14,836,268.44	*18,395,511.61
Uncollectible Railway Revenues	77,317.87	68,692.50
Equipment and Joint Facility Rents	*474,739.18*	*247,439.71*
Net Railway Operating Income	$41,268,307.35	$40,003,402.02
Compensation under Federal Control Contract —Accrued	3,175,149.38	
Other Income	7,906,451.99	6,723,386.72
Gross Income	$52,349,908.72	$46,726,788.74
Miscellaneous Tax Accruals	225,828.30	46,508.20
Rent for Leased Roads and Other Charges	839,416.98	426,654.76
	$51,284,663.44	$46,253,625.78
Interest on Bonds, including accrued interest on Adjustment Bonds	11,953,001.53	11,871,255.06
Net Corporate Income (representing amount available for dividends and surplus)	$39,331,661.91	$34,382,370.72

From the net corporate income for the year the following sums have been deducted:

Dividends on Preferred Stock—		
No. 48 (2½%) paid Aug. 1, 1922	$3,104,342.50	
No. 49 (2½%) paid Feb. 1, 1923	3,104,342.50	
		$6,208,685.00
Dividends on Common Stock—		
No. 68 (1½%) paid June 1, 1922	$3,394,357.50	
No. 69 (1½%) paid Sept. 1, 1922	3,398,512.50	
No. 70 (1½%) paid Dec. 1, 1922	3,405,292.50	
No. 71 (1½%) paid March 1, 1923	3,407,497.50	
		13,605,660.00
Appropriation for Fuel Reserve Fund		73,117.57
California-Arizona Lines Bonds Sinking Fund		17,371.16
S. F. & S. J. V. Ry. Co. Bonds Sinking Fund		22,173.69
		19,927,007.42
Surplus carried to Profit and Loss		$14,455,363.30

*Includes $2,835,305 Federal Taxes on net credit resulting from settlement with the United States Railroad Administration.

Surplus to credit of Profit and Loss, December 31, 1921		$106,345,371.41
Adjustment of accounts in connection with final settlement with United States Railroad Administration in accordance with order of Interstate Commerce Commission of January 25, 1922	22,682,439.84	
		$129,027,811.25
Adjustment of Guaranty Claim under Transportation Act—1920	$1,757,594.49	
Surplus Appropriated for Investment in Physical Property	144,680.92	
Sundry Adjustments	46,816.81	
	1,949.092.22	
		127,078,719.03
Surplus to credit of Profit and Loss, December 31, 1922		$141,534,082.33

"Other Income" consists of interest accrued and dividends received on securities owned, including United States Government securities, interest on bank balances, rents from lease of road and other property, and other miscellaneous receipts.

During the year the sum of $400,000 in cash was received as the net proceeds of sale of land embraced in the Santa Fe Pacific Land Grant, but this was directly written off the book value of Road and Equipment and the transaction does not appear in the Income Account.

CAPITAL EXPENDITURES AND REDUCTION OF BOOK VALUES.

The total charges to Capital Account, as shown by the General Balance Sheet, at December 31, 1922, aggregated $896,197,417.32, as compared with $848,331,494.19 at December 31, 1921, an increase during the year of $47,865,923.13.

COMPARISON OF OPERATING RESULTS.

The following is a statement of revenues and expenses of the System for the year ending December 31, 1922, in comparison with the previous year:

	Year Ending Dec. 31, 1922	Year Ending Dec. 31, 1921	Increase or *Decrease*
OPERATING REVENUES:			
Freight	$158,026,370.21	$160,217,450.07	—$2,191,079.86
Passenger	48,644,528.72	52,594,550.80	—3,950,022.08
Mail, Express and Miscellaneous	18,453,645.44	16,113,069.04	2,340,576.40
Total Operating Revenues	$225,124,544.37	228,925,069.91	—$3,800,525.54
OPERATING EXPENSES:			
Maintenance of Way and Structures	$36,183,241.12	$31,734,121.69	$4,449,119.43
Maintenance of Equipment	51,069,933.12	52,472,940.62	—1,403,007.50
Traffic	3,900,057.01	3,748,699.93	151,357.08
Transportation—Rail Line	71,122,569.99	80,283,618.07	—9,161,048.08
Miscellaneous Operations	180,003.80	63,053.26	116,950.54
General	5,003,917.67	5,425,601.78	—421,684.11
Transportation for Investment— Cr.	—555,344.76	—510,119.92	—45,224.84
Total Operating Expense	$166,904,377.95	$173,217,915.43	—$6,313,537.48
Net Operating Revenue	$58,220,166.42	$55,707,154.48	$2,513,011.94
Railway Tax Accruals	18,395,511.61	14,836,268.44	3,559,243.17
Uncollectible Railway Revenues	68,692.50	77,317.87	—8,625.37
Railway Operating Income	$39,755,962.31	$40,793,568.17	—$1,037,605.86
Equipment Rents—Net—Cr.	892,713.25	1,165,608.33	—272,895.08
Joint Facility Rents—Net—Dr.	645,273.54	690,869.15	45,595.61
Net Railway Operating Income	$40,003,402.02	$41,268,307.35	—$1,264,905.33

NOTE—The operating expenses reported above for the year ending December 31, 1921, exclude maintenance equalization credits so as to reflect actual expenditures applicable to that year.

The average tons of freight (revenue and company) per loaded car mile decreased from 22.11 to 21.51, or 2.71 per cent.

The average tons of freight (revenue and company) carried per freight-train mile (freight and mixed) increased from 553.34 to 582.23 or 5.22 per cent.

The average freight revenue per freight-train mile decreased from $7.39 to $7.09, or 4.06 per cent.

The average passenger revenue per passenger-train mile decreased from $2.32 to $2.18 or 6.03 per cent.

The average passenger-train revenue per passenger-train mile decreased from $2.86 to $2.82 or 1.40 per cent.

The tons of freight carried one mile (revenue and company, but excluding water ton miles) increased 982,365,901 or 8.19 per cent., while miles run by freight cars (loaded and empty) in freight and mixed trains increased 28,307,481 or 3.25 per cent., and the mileage of such trains increased 611,696 or 2.82 per cent.

The number of passengers carried one mile decreased 73,778,882 or 4.77 per cent., while miles run by passenger-train cars (excluding work) in passenger and mixed trains increased 1,912,869, or 1.16 per cent., and the mileage of such trains decreased 393,419, or 1.73 per cent.

CAPITAL STOCK AND FUNDED DEBT.

The outstanding Capital Stock on December 31, 1921, consisted of:

Common	$225,397,500.00	
Preferred	124,173,700.00	
		$349,571,200.00
Issued during the year:		
Common Stock issued in exchange for Convertible Bonds retired		1,655,000.00
Capital stock outstanding December 31, 1922:		
Common	$227,052,500.00	
Preferred	124,173,700.00	
		$351,226,200.00

The number of holders of the Company's capital stock at the close of the last five years and the changes in number from year to year were as follows:

	Common		Preferred	
	Number	Increase for Year	Number	Increase for Year
1918	30,892	2,223	18,749	1,147
1919	31,281	389	19,643	894
1920	36,469	5,188	21,367	1,724
1921	39,614	3,145	22,065	698
1922	41,845	2,231	22,798	733

The outstanding Funded Debt of the System amounted, on December 31, 1921, to $289,888,269.20

The following changes in the Funded Debt occurred during the year:

Obligations Retired:		
Convertible 4% Bonds	$1,655,000.00	
S. F. & S. J. V. Ry. Co. First Mortgage 5% Bonds	20,000.00	
Equipment Trust 6% Notes	490,400.00	
Miscellaneous Bonds	1,130.00	
	$2,166,530.00	
Obligations Issued:		
California-Arizona Lines First and Refunding Mortgage 4½% Bonds	854.40	
Decrease of Funded Debt		2,165,675.60
Total System Funded Debt outstanding December 31, 1922		$287,722,593.60

TREASURY.

Neither this Company nor any of its auxiliaries has any notes or bills outstanding.

The Company held in its treasury on December 31, 1922, $41,421,264.13 cash. In addition, the Company owns $43,107,250.00 of United States Government securities, which are carried at cost of $43,180,262.00 in the general balance sheet.

FUEL RESERVE FUND.

The fund has been increased during the year by appropriations of income as follows:

Amount to credit of Fund December 31, 1921	$2,256,255.86
Added during the year	73,117.57
In Fund December 31, 1922	$2,329,373.43

CONSTRUCTION OF NEW LINES

The present status of new lines under construction is as follows:

THE DODGE CITY AND CIMARRON VALLEY RAILWAY.

The branch of the above named railway extending from Satanta to Manter, Kansas, a distance of 53.87 miles, was placed in operation January 1, 1923.

ELDORADO AND SANTA FE RAILWAY.

This Company has been organized to construct a cut-off with a low-grade line between the main line of your Company at Ellinor, Chase County, Kansas, and the southerly limits of Eldorado, Butler County, Kansas, a distance of 50.4 miles. The new line will be 13.65 miles shorter than the present line between the above termini (via Florence) and will take from the single track line between Eldorado and Florence, which has reached its capacity, all through westbound, and a part of the eastbound, freight traffic. Work is actively under way and it is expected that the mileage will be placed in service by the end of the present year.

HICKMAN SPUR.

During the year there was constructed and placed in service a branch line, designated as above, extending from a point on the main line of your railroad 1.7 miles north of the station of Burbank, in Osage County, Oklahoma, in a northeasterly direction a distance of 6.24 miles to a terminus 2 miles northeast of De Noya in the same county; also a spur from said branch in an easterly direction a distance of 2.9 miles. This construction was necessary to secure to your Company its proper share of traffic in the Hickman and Burbank Oil Fields.

OSAGE COUNTY AND SANTA FE RAILWAY.

Active work was resumed on the part of this line extending from Owen to Pawhuska, Oklahoma, a distance of 35.3 miles, but flood and labor shortage difficulties have prevented completion within the calendar year. It is expected to place the line in service this Spring.

SANTA FE AND LOS ANGELES HARBOR RAILWAY.

This Company has been organized to construct a line 12.54 miles in length from a point on the Redondo Branch near the station of El Segundo, Los Angeles County, California, to a point of connection at Wilmington, in the same county, with the tracks of the City of Los Angeles Belt Line which serve exclusively the majority of the docks at Los Angeles Harbor, now one of the principal seaports on the Pacific Coast. The new line will also pass through and serve the Redondo-Torrance Oil Fields. This mileage should be placed in operation during the current year.

ADDITIONAL MAIN TRACK MILEAGE.

The mileage of second track in operation at December 31, 1922, was 1,257.53 miles, with additional track under construction or work authorized as follows:

WORK IN PROGRESS:	
Yampai to Hackberry, Arizona	37.0 miles
Louise to Topock, Arizona	51.9 "
Bagdad to Daggett, California	65.1 "
	154.0 "
WORK AUTHORIZED:	
Mission to Burrton, Kansas	13.0 miles
Dalies to Rio Puerco, New Mexico	8.6 "
Perea to Defiance, New Mexico	23.6 "
Kern Junction to Bakersfield, California	3.9 "
	49.1 "

When this work is completed the second main track in operation will exceed 1,460 miles, and will include 544 miles of the Company's main line between Dalies, near Albuquerque, New Mexico, and Barstow, California, a distance of 715 miles, over which its entire transcontinental traffic is handled.

FEDERAL CONTROL SETTLEMENT.

Settlement between the United States Railroad Administration and your Company and affiliated companies, parties to the Federal control contract of November 22, 1918, was made on October 10, 1922, $21,500,000 being accepted in full satisfaction and discharge of all claims in connection with the possession, use and operation of the properties by the United States during Federal control. After disposition in full of all amounts due the Railroad Administration for additions and betterments made during Federal control, expenses and liabilities paid chargeable to the companies under the contract, and for all amounts due from the Director General for balance of compensation, cash and other assets taken over or collected by him, accrued depreciation, property retired and not replaced, recess in materials and supplies, under-maintenance, etc., there remained a credit balance on the books of $22,682,439.84. This balance, in compliance with the order of the Interstate Commerce Commission dated January 25, 1922, with respect to accounting for settlements with the Railroad Administration, was closed into Profit and Loss.

GUARANTY UNDER TRANSPORTATION ACT, 1920

As stated in the last annual report $7,599,500 of amount due your Company under the provisions of Section 209 of the Transportation Act, 1920, was certified by the Interstate Commerce Commission and collected during 1921. Claim for balance due in final settlement was filed with the Commission in accordance with its order of December 15, 1921, in the early part of 1922. During the last year substantial agreement was reached on all matters involved in the settlement except as to what constitutes a fair allowance for maintenance during the guaranty period. It is expected the determination of this amount will be arrived at shortly and final settlement then effected. In the meantime the claim for the balance due under the guaranty is being carried in the balance sheet in the sum of $1,500,000.

TAXES.

Federal, State and Local tax accruals for the year 1922 aggregate $18,395,511.61, and show an increase over the year 1921 of $3,559,243.17. A comparison for the two years of Federal tax accruals and of State and Local accruals is presented in the following table:

	1922	1921	Increase
FEDERAL TAXES:			
Income and War Taxes..	$7,252,124.15	$4,338,844.49	$2,913,279.66
Capital Stock	544,406.50	298,203.06	246,203.44
Stamp and License Taxes.	2,285.17	7,485.26	—5,200.09
Total Federal	$7,798,815.82	$4,644,532.81	$3,154,283.01
State and Local	10,596,695.79	10,191,735.63	404,960.16
Grand Total	$18,395,511.61	$14,836,268.44	$3,559,243.17

The Federal income tax accruals for 1922 include $2,835,305 on net credit to Profit and Loss resulting from the settlement with the United States Railroad Administration, which, together with the increase in the tax rate from 10 to 12½ per cent., accounts for the increase in such taxes.

State and Local tax accruals increased $404,960.16. Several states show increase and several others show decreases. In California the advanced rate of 7 per cent. on gross receipts fixed by the legislature of 1921 applied to the whole of the year 1922, whereas it applied only to the second half of the year 1921. Accruals for California increased $445,676.33. The validity of the advance of the California gross receipts tax rate from 5.25 to 7 per cent. is still in process of adjudication in the United States district court for the northern district of California.

There are indications that the flood tide of public expenditures has passed. In several of the states in which your Company operates the taxpayers have come to realize that the programs of public expenditures that they have approved are extravagant and beyond their means and ability. Delinquency in the payment of taxes has reached unusual proportions. In some states the people are insisting so loudly on the reduction of tax burdens that even road and school programs are being abridged and postponed.

GENERAL.

One outstanding feature of the year's railroad operations is the clear demonstration of the country's imperative need for greatly increased transportation facilities, a need which has been realized and persistently urged by the railroads since the termination of Federal control. At the beginning of 1922 your Company undertook as large a program of improvements as seemed possible and carried it through; but only a beginning was made of providing for the traffic demands of its territory. For the year 1923 contracts have been let for 7,150 freight cars and 59 new locomotives, to be delivered before July 1st, in readiness for the movement of this year's crops. This equipment, together with eight passenger cars on order and improvements to existing equipment, will cost upwards of $24,000,000. The second track work undertaken and authorized since the beginning of 1922, involves an expenditure of over $15,000,000. Preliminary work is under way for a new double-track bridge over the Mississippi river to cost $4,000,000, which is imperatively required by the density of the traffic over the Chicago-Kansas City line and the heavy power necessary to haul it economically. Enlargement of shops, terminals, and sidings will be pushed and it is probable that our cash expenditures during the year for all improvements, and equipment, will amount to at least $60,000,000. The improvements have been practically confined to what will increase capacity for handling traffic, other improvements, even though desirable, being deferred, because the present program is all that the Company can efficiently handle this year.

The railroads have now been operating for three years under the Transportation Act, 1920, and there are many proposals for changes before Congress. Conditions during this period have been very trying for all concerned, the shipping and traveling public, railroad employes and managers, the Interstate Commerce Commission and the Labor Board. When the difficulties which have confronted the railroads in these three years and the possibilities of serious disaster which threatened at times are considered, the physical progress, the additions to property and equipment during the last twelve months with large orders now being filled and new ones being placed daily, and the gradual improvement in general conditions, all indicate that there is real merit in this law. In this connection, we would call attention to the verdict of the Joint Commission on Agricultural Inquiry, consisting of five United States Senators and five members of the House of Represenatives, that "The Transportation Act as a whole is a most valuable piece of constructive legislation and gives promise of working out to the great benefit of the country."

During the year your Company, in common with all other railroads of the country, was called upon to meet a disastrous strike of its shop forces. In spite of this handicap distinct progress was made in rehabilitation of roadway and equipment, which had become impaired by reason of war conditions during the time the railroad was under Government control.

Attention is directed to the classes of revenue freight tonnage handled by the System as shown on pages 38 and 39 of this report. The tonnage of agricultural products carried during the year while showing a decrease as compared with the "record" figures of 1921 has been exceeded but twice in the history of the Company. In addition to the large volume of traffic of this character there were substantial increases in other commodities, particularly "ores" under "Products of Mines" and "refined petroleum and its products" under "Manufactures and Miscellaneous," so that the total revenue freight tons and the total revenue ton miles handled during the year increased 4,753,158 and 802,185,818 respectively. The statement referred to reflects the quite general distribution of heavy tonnage among the several commodities included in the major groups of traffic handled, which, in connection with the wide territory served, is a protection against the failure of any particular crop or class of traffic seriously affecting the earnings of your Company.

There has been a substantial revival of business throughout the territory served by your railroad, this being especially marked in cotton growing, copper mining, sheep raising, lumber, and oil.

On November 2, 1922, your Board of Directors suffered an irreparable loss in the death of Mr. Thomas DeWitt Cuyler.

Unremitting in his attention to duty, courageous in the face of difficulties, wise in counsel both for matters of finance and of operation, he had the vision to see what most needed doing and the patience to wait for the right time to do it.

His activities were widely extended, and as Chairman of the Association of Railway Executives his influence was powerfully felt. In negotiations between different companies his ability to evoke harmony out of apparently irreconcilable conflict amounted almost to genius. His unfailing courtesy disarmed antagonism; his high principles and transparent good faith inspired every one with whom he came in contact, with the spirit of fair dealing and with due regard for the common interest.

Your Directors acknowledge with pleasure the faithful and efficient services rendered by the officers and employes of the Company.

W. B. STOREY,
President.

Railway Officers

Executive

George S. Hobbs, vice-president in charge of traffic of the Maine Central, has tendered his resignation and voluntarily retired. Effective May 1; the office has been abolished.

R. R. Farmer, division superintendent on the Missouri-Kansas-Texas Railway of Texas, with headquarters at Greenville, Tex., has been elected vice-president of the Louisiana Railway & Navigation Company of Texas, with the same headquarters.

James J. Turner, vice-president in charge of corporate work of the Pennsylvania, Lines West of Pittsburgh, retired from active service under the company's pension plan on May 1.

J. J. Turner

Mr. Turner was 70 years of age on April 7 and has spent his entire career with the companies comprising the Pennsylvania Railroad System and has served altogether for fifty-three years. He started as a ticket sorter at Steubenville, Ohio, on February 15, 1870. Shortly thereafter he became a telegraph operator on the Columbus, Chicago & Indiana Central at Richmond, Ind., and successively filled the positions of train dispatcher and chief clerk to the superintendent. In 1880 he was appointed superintendent of the Indiana & Vincennes and five years later became superintendent of the Eastern division of the Chicago, St. Louis & Pittsburgh. In 1888 he was appointed superintendent of the Pittsburgh division of the Pittsburgh, Cincinnati, Chicago & St. Louis. In 1896 he became vice-president and general manager of the Vandalia. In 1901 he was elected fourth vice-president of the Pittsburgh, Cincinnati, Chicago & St. Louis and also the Pennsylvania Company. The following year he was elected third vice-president and in 1907, second vice-president. In 1914 he became first vice-president in charge of the entire system west of Pittsburgh. During the war Mr. Turner exercised supervision over the corporate interests of the Pennsylvania, Lines West of Pittsburgh. Upon the termination of federal control, he was appointed vice-president of the Pennsylvania Railroad in charge of corporate matters of the western lines. Mr. Turner was president of the Chicago Union Station Company of the Pennsylvania-Detroit Railroad and had charge of negotiations leading up to the entrance of the Pennsylvania into Detroit.

Financial, Legal and Accounting

G. G. Baird has been appointed assistant land commissioner of the Canadian National with headquarters at Winnipeg.

R. P. Ormsby has been appointed secretary of the Canadian National and **Henry Philips** has been appointed assistant secretary, both with headquarters at Montreal. These appointments cover all subsidiary companies with some few exceptions.

C. W. Myers has been appointed real estate agent of the Long Island with headquarters at New York, succeeding H. A. Howarth, resigned to accept service with another company. **L. J. Carruthers** has been appointed assistant real estate agent and assistant general solicitor.

E. P. Twyman, auditor of disbursements of the Louisiana Railway & Navigation Company, with headquarters at Shreveport, La., has been elected auditor, secretary and treasurer of the Louisiana Railway & Navigation Company of Texas, with headquarters at Greenville, Tex.

Edward Arnold has been appointed general freight claim agent of the Canadian National with headquarters at Montreal with jurisdiction over the entire system with the exception of the Grand Trunk, Western lines. The following additional appointments have been made in the freight claim department of the system: **O. Cameron,** freight claim agent, Moncton, N. B.; **H. McDonald,** freight claim agent, Toronto, Ont.; **A. G. Gilmour,** freight claim agent, and **J. W. Connell,** assistant freight claim agent, Winnipeg; **T. Ginnelly,** assistant freight claim agent, Vancouver.

Operating

C. D. Thornton has been appointed supervisor of rules of the Seaboard Air Line with headquarters at Norfolk, Va.

R. W. Edwards, superintendent of car service of the Missouri, Kansas & Texas, has been appointed district manager of the Car Service Division, American Railway Association, with headquarters at Toledo, O.

T. B. Hamilton, general manager of the Northwestern region of the Pennsylvania, with headquarters at Chicago, who has been on leave of absence on account of sickness, resumed his duties on May 1. **W. B. Wood,** who has been acting general manager of the Northwestern region during Mr. Hamilton's absence, resumed his duties as general superintendent of the Illinois division, with headquarters at Chicago, at the same time.

C. H. Sauls has been appointed superintendent of the Virginia division of the Seaboard Air Line with headquarters at Raleigh, N. C., succeeding C. D. Thornton, assigned to other duties. **W. G. Jones,** superintendent of the East Carolina division with headquarters at Charleston, S. C., has been transferred to the North Carolina division with headquarters at Hamlet, N. C., succeeding **E. T. Gibson** who has been appointed superintendent of the East Carolina division.

J. B. Carothers, assistant to the general manager of the Baltimore & Ohio, Western lines, with headquarters at Cincinnati, Ohio, has been promoted to superintendent of the Ohio division, with headquarters at Chillicothe, Ohio, succeeding A. A. Iams, transferred. It was erroneously reported in the *Railway Age* of April 21, that M. D. Carothers, assistant engineer, maintenance of way of the Baltimore & Ohio, Chicago terminal, with headquarters at Chicago, had been appointed superintendent of the Ohio division.

D. Coughlin, manager of the First district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Ia., has been appointed general manager of the First district, with the same headquarters. **A. B. Warner,** manager of the Second district, with headquarters at El Reno, Okla., has been appointed general manager of the Second district, with the same headquarters. **A. W. Towsley,** assistant to the vice-president and general manager, with headquarters at Chicago, has been appointed general superintendent of transportation, with the same headquarters.

C. L. Sauls, trainmaster of the North Carolina division of the Seaboard Air Line with headquarters at Hamlet, N. C., has been assigned to duties in the superintendent's office and has been succeeded by **T. A. Norris. A. L. Pritchett** has been appointed trainmaster of the Virginia division with headquarters at Raleigh, N. C. **J. S. Riggan** has been appointed chief dispatcher at the same point. **M. H. Gold** has been appointed trainmaster of the South Carolina division with headquarters at Savannah, Ga. **W. G. Guess** has been appointed assistant trainmaster of the Florida division with headquarters at Tampa, Fla.

J. C. Johnson, general superintendent of transportation of the Eastern region of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed general superintendent

of telegraph, with the same headquarters, succeeding **G. A. Cellar,** who has retired. **J. W. Roberts,** general superintendent of transportation of the Northwestern region, with headquarters at Chicago, has been transferred to the Eastern region, with headquarters at Philadelphia, Pa., succeeding Mr. Johnson. **R. C. Morse,** superintendent of the Philadelphia Terminal division, with headquarters at Philadelphia, Pa., has been promoted to general superintendent of transportation of the Northwestern region, with headquarters at Chicago, succeeding Mr. Roberts. **H. H. Garrigues,** superintendent of the Atlantic division and the Camden Terminal division, with headquarters at Camden, N. J., has been transferred to the Philadelphia Terminal division, with headquarters at Philadelphia, Pa., succeeding Mr. Morse.

Mechanical

S. B. Andrews has been appointed mechanical engineer of the Chesapeake & Ohio succeeding J. J. Ewing, assigned to other duties.

G. Durham has been appointed superintendent of motive power and cars of the Wheeling & Lake Erie with headquarters at Brewster, Ohio.

W. J. Tollerton, general mechanical superintendent of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been given the title of general superintendent, motive power.

F. W. Hankins, assistant chief of motive power of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed general superintendent of motive power of the Central region, with headquarters at Pittsburgh, Pa., succeeding **H. H. Maxfield,** who has been appointed superintendent of motive power of the Southern division, with headquarters at Wilmington, Del. **A. C. Davis,** superintendent of motive power of the Southern division, with headquarters at Wilmington, Del., has been appointed assistant chief of motive power with headquarters at Philadelphia, Pa., succeeding Mr. Hankins. **T. B. Farrington,** master mechanic, with headquarters at Columbus, Ohio, has been appointed assistant works manager of the Altoona shops at Altoona, Pa. **R. H. Flynn,** master mechanic, with headquarters at Indianapolis, Ind., has been transferred to Columbus, Ohio, succeeding Mr. Farrington. **W. R. Davis,** assistant master mechanic, with headquarters at Wilmington, Del., has been promoted to master mechanic, with headquarters at Indianapolis, Ind., succeeding Mr. Flynn.

Hugh Pattison, who during the past two years has been employed by the Illinois Central in connection with the electrification of that road, has been appointed engineer of electric traction of the Virginian Railway. Mr. Pattison graduated from the Johns Hopkins University as an electrical engineer in 1892. The first work that he did upon leaving college was the wiring and installation of electrical apparatus on naval vessels at the Navy Yard in Norfolk, Va. At this place he held the position of foreman. He became assistant engineer with Sprague, Duncan & Hutchinson, consulting engineers of Baltimore, in 1893. Shortly afterward he became associated as engineering assistant with Frank J. Sprague, vice-president and technical director of the Sprague Electric Company in New York. This association continued until 1903, during which time Mr. Pattison assisted in equipping and operating multiple unit control on the Boston Elevated and Brooklyn railroads. In 1905, Mr. Pattison joined the Westinghouse, Church, Kerr Company as an engineer, and from that time until 1911, during the electrification of the Pennsylvania tunnel into New York, Mr. Pattison was assistant engineer of electric traction for George Gibbs, consulting engineer. A little later he had charge of the electrification of the West Jersey & Seashore Railroad, from Camden to Atlantic City. An experimental single phase electric railway on the Long Island Railroad was also built by him and numerous locomotive tests on the West Jersey & Seashore Railroad were carried out under his supervision. Mr. Pattison was appointed engineer in charge of the Chicago Association of Commerce Committee in the study of smoke abatement and the electrification of terminal railroads in Chicago in 1911. After completing his work in Chicago, he was retained by the Westinghouse Electric & Manufacturing Company and was engaged in making special engineering studies under the direction of F. H. Shepard. He resigned this position when he entered the employ of the Illinois Central.

Engineering, Maintenance of Way and Signaling

J. F. Leonard, whose appointment as engineer of bridges and buildings of the Pennsylvania with headquarters at Pittsburgh, Pa., was announced in the *Railway Age* of April 7, page 933, was born in 1879 at Salisbury, Md. He was graduated from Lehigh University in 1905 with a degree in civil engineering and entered the service of the Pennsylvania, lines west of Pittsburgh, in the bridge department. In 1910 he left the Pennsylvania and entered the service of the Aluminum Company of America on constrution and plant operation at Niagara Falls, N. Y. The following year he returned to the service of the Pennsylvania as assistant engineer of bridges. During the war he served as a first lieutenant of the Twenty-second Engineers with the A. E. F. In July, 1919, he returned to his duties with the Pennsylvania as assistant engineer of bridges and held that position until the time of his recent promotion.

John Attwill Ellis, whose appointment as assistant engineer of roadway standards of the Canadian National was announced in the *Railway Age* of April 7, page 933, was born on October 15, 1882, at Arbroath, Scotland. He was educated at the City and Guilds Central Technical College, London, and entered railway service in 1903 on construction with the Great Northern, Picadilly & Bromton. In 1904 and 1905 he served as an assistant on a surveying staff for the Great Northern (England). Then for a short time he served as assistant on the signal engineering staff. From 1905 to 1909 he was subdistrict officer on maintenance, for the Oudh & Rohilkhand, India. In 1909 and 1910 he was subdistrict officer on construction for the same company. In 1911 he entered the service of the Canadian Northern as a leveler on construction and location and in the following year entered the service of the Canadian Pacific as transitman on location. From 1912 to 1915 he was resident engineer on construction. From 1915 to 1918 he was assistant engineer for the Canadian Government Railways and from the latter year to 1921, office engineer for the Canadian National.

Special

John L. Cobbs, Jr., has been appointed director of public relations of the Atlantic Coast Line with headquarters at Wilmington, N. C.

The following appointments have been made in the bureau of economics of the Canadian National with headquarters at Montreal: **S. W. Fairweather,** assistant to director; **V. I. Smart,** special engineer; **A. S. Going,** terminal engineer; **E. B. Walker,** electrical engineer.

Obituary

W. H. Myers, retired vice-president of the Pennsylvania, died at Redlands, Cal., on April 30. Mr. Myers was born in San Antonio, Texas, on April 9, 1856. He was educated in private schools and at the school of mines, Freiburg, Germany. He entered the service of the Pennsylvania in 1876 as a rodman at Altoona and shortly afterwards became assistant supervisor and then supervisor at main line points between Philadelphia and Harrisburg. He subsequently served on various divisions as assistant engineer and was advanced to superintendent of the Bedford division in 1889, afterwards acting in that capacity on the Belvedere, Schuylkill and middle divisions. In 1900 he became general superintendent of the Philadelphia & Erie and North Central, two of the company's subsidiaries. In 1909 he was promoted to general manager. Two years later he became fifth vice-president. In 1912 he was appointed vice-president in charge of real estate, purchases and insurance. Mr. Myers retired from active service on March 1, 1920. He lived at Haverford, Pa.